

**UTAH DEPARTMENT OF TRANSPORTATION I-15  
CASE STUDY  
(DESIGN-BUILD CONTRACTING STRATEGY)**



**Master's of Engineering Report**

**DONNA KIMBALL**

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**Dr. Stuart Anderson, Committee Chair**

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## **I. INTRODUCTION**

Traditionally, public agencies have been limited to competitive bids to procure construction contracts. However, public agencies are tiring of the low bid process and the resultant poor quality product that accompanies it. Many public agencies are opting to petition and challenge the procurement laws to allow use of negotiated procurements. Negotiated procurements allow quality and past history of the design-builder to be considered (sometimes heavily) when selecting a construction contractor. Although some states have adopted legislation that allows the use of innovative contracting methods, many others have not. However, more states may change in the near future and are watching closely the use of design-build (best value) contracting strategy for a public highway project by Utah Department of Transportation (UDOT). UDOT, with its progressive vision has embarked on the single largest design-build and performance-based project in the United States at \$1.6 billion with the total reconstruction of Interstate I-15 in four and one-half years.<sup>1</sup>

### **PURPOSE**

Because there is great potential for additional public works agencies using design-build (best-value) strategies, a need exists to document the salient features of the I-15 project. By studying this enormous project, the successes and lessons learned may be applied to the next negotiated project. In addition, if the contract continues on its successful path additional progressive legislation may be petitioned from state agencies seeking to increase the construction value for tax dollars expended. Towards this end, this report documents the pre-award and construction of Interstate I-15 reconstruction. More specifically, this case study captures the background information used to support the design-build contracting strategy decision,

challenges, innovations, significant construction methods and factors contributing to the project success.

## II. RESEARCH METHODOLOGY

In order to fulfill the purpose stated in the previous section, a thorough literature review was performed that included articles from Engineering News Record, Civil Engineering, Roads & Bridges, Public Works Financing, Public Road and the Transportation Research Board. The articles were varied on the content of the I-15 reconstruction and provided a broad but shallow introduction into the many aspects of the project. Using the article and journal information, approximately two dozen salient project features were gathered and organized. This provided an overall understanding of the project and created great interest and curiosity concerning details. Additionally, specific information was obtained from the UDOT I-15 Project Specifications on CD-ROM. The CD held all 21 sections of the Request For Proposal (RFP) and the addendum to the RFP. After reviewing the project specifications, a list of questions were developed to propose to UDOT. These questions included issues that required clarifications due to contradictions between the literature review and the specifications and general information to gain a full understanding and appreciation of the project. Table 1 contains a sample list of questions submitted to UDOT and Appendix A contains both the questions and short answers that was a product of the interview process.

As part of the data gathering effort, a site visit was made to Utah on March 18, 1999 which allowed personal interviews with UDOT and Parsons Brinkerhoff (PB) personnel to facilitate answering the many questions of this enormous project. In addition to providing supporting information and clarification to the literature already researched, additional literature was secured that included the winning contractor's proposal, the first required submittal from UDOT to the Federal Highway Administration (Special Experimental Project-14 Report), the revised Award Fee Procedure Manual and the I-15 Reconstruction Project Monthly Report for October



and November of 1998. Unfortunately, the contractor (Wasatch Constructors) was unavailable for an interview during the site visit. However, a windshield tour of the entire corridor was performed and a short walking tour in the downtown segment provided the opportunity to capture some photographic evidence of structural distress adjacent to a Right-Of-Way limit.

**TABLE 1: SAMPLE QUESTIONS PROPOSED TO UDOT**

<b>REQUESTED DOCUMENTS</b>	Can I get a copy of the organization chart for both the contractor and the owner?
	Can I get a copy of the risk matrix developed by UDOT?
	Do you have a cross section of a wick drain that is typically being installed in the project?
<b>GENERAL CONTRACT</b>	What was your basis for assuming \$200 million in federal funding?
	What impact did FHWA have on the decision to go design-build?
	How many contractors requested packages to bid upon?
	Who were the observers for the final selection?
<b>GEOTECHNICAL</b>	Has there been any structural damage caused to adjacent properties?
	What is meant by saying that UDOT will assume the risk that the geotechnical information is correct?
<b>AWARD FEE</b>	What happens if there is a dispute between the contractor and UDOT concerning the award fees?
	Can you explain the calculation for the award fees?
<b>FUNDING</b>	Where is the funding for the project coming from?
	Why is there a cap on the payment schedule?
<b>ATMS</b>	What features of the ATMS are being used during the construction period?
<b>RIGHT-OF-WAY</b>	Who did the demolition and relocations?
	What happened if the people did not want to move?
<b>OCIP</b>	Can you describe the OCIP program?
	What drove the decision to use OCIP?
	How is money saved by using OCIP?
<b>CONTRACTOR</b>	What was most challenging in putting your proposal together?
	What are your lessons learned thus far?
	How big of an issue was laydown and staging areas?
<b>MATERIALS</b>	What unique materials are being used?

As a follow-up to the on-site meetings with UDOT and PB, correspondence via email and telephone conversations were used to further facilitate an understanding of the project. Finally, on May 14, 1999 Wasatch Constructor's Design/Construction Manager was contacted to discuss questions relative to their proposal and perspective. As a follow-up to this conversation the Vice-President of the Heavy Civil Division of Granite Construction was contacted to answer one remaining question.

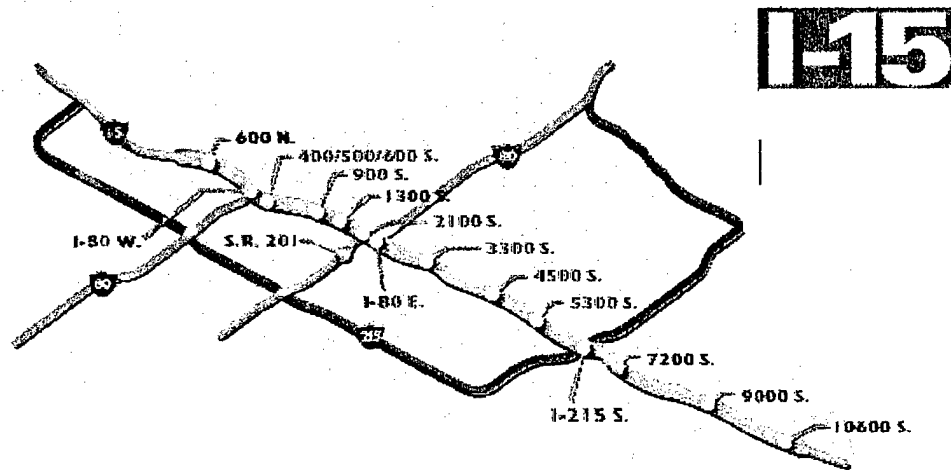
Again, the articles provided an outline of several interesting and unique features of the project. However, they were brief and did not fully expose the salient features in detail. Additionally, many questions remained after completing the literature review and specification review that were only resolved by interviewing the I-15 team. The completion of the interviewing process allowed adequate capture of the effort involved not only in the construction of the project but in the preparation and selection of the most appropriate design-builder. The research is organized into nine chapters as follows: Chapter III Preconstruction Phase documents the preparation work and issues concerning the design-build decision. Chapter IV Selection Process contains information and procedures followed by UDOT and PB to select the best proposal for the Utah taxpayers. Chapter V Pre-Project Planning highlights some vital engineered planning necessary to secure a successful start to construction. Chapter VI Contract Provisions documents some unique and innovative provisions to facilitate quality construction. Chapter VII Risk captures actions taken by UDOT to assume and allocate project risks to the proper team organization for management. Chapter VIII Construction Material and Methods highlights innovative engineered solutions to overcome the inherent conditions associated with an ancient salt lake. Chapter IX Lessons Learned reports the successes and recommendations learned thus far on the project. Chapter X and XI Summary and Conclusion respectively, reflect on the overall project and the positive aspects and advantages of using the design-build best-value selection contracting strategy.

## **INTERVIEWEES**

UDOT Project Director	PB Utilities Coordinator
UDOT Contracts Manager	Wasatch Constructors Design/Construction Manager
UDOT Technical Support Manager	Granite Construction VP Heavy Civil Division
PB Engineering Oversight Administrator	

### III. PRECONSTRUCTION PHASE

**FIGURE 1: I-15 OVERVIEW MAP**



#### DESCRIPTION OF PROJECT

Figure 1 shows the scope of the I-15 reconstruction which is 26 km from 10800 South to 600 North along the existing I-15 corridor. Reconstruction is to be completed in only four and one-half years with October 15, 2001 as the scheduled completion date and the option for UDOT to choose 10 years maintenance thereafter. Some key features of the projects include:<sup>1</sup>

- New High Occupancy Vehicle (HOV) lane
- Auxiliary lanes between interchanges.
- New interchange at 400 South
- Existing interchanges and junctions reconfigured
- Local street interchanges converted to Single Point Urban Interchanges (SPUT's)
- 135 bridges demolished
- 130 bridges rebuilt (SPUT's, overpasses, viaducts and flyovers)
- Number of Lanes increase from 6 to 12

- Potentially 10 years maintenance after construction
- Reconstruct 3 major junctions
- Advanced Traffic Management System components
- Utility relocation
- Modification of small portions of I-215, I-80, State Route 201
- Railroad grade separation structures

## **BACKGROUND/SCOPE**

I-15 was constructed through Salt Lake County in the 1960's as part of the National System of Interstate and Defense Highways. As the Interstate neared its 20-year design life the Wasatch Front Region Council (WFRC) (the regional planning agency) began to study the corridor to determine the inadequacies. They used growth projections and other social-economic factors to forecast travel on the corridor. Estimated traffic volumes in the corridor for the year 2015 were forecasted using MINUTP computer modeling. The travel times, vehicle speeds, number of occupants per vehicle, and mainline accidents were all studied to assess existing and predict future levels of service. Once the lane requirements were determined the lengthy process of the Environmental Impact Statement (EIS) began.<sup>2</sup>

While the pending winter Olympics of 2002 played a role in determining the completion date, the reason the construction was undertaken was to replace an overcrowded and failing infrastructure. Like many of the nation's interstates, the age and increased traffic have taken their toll on the interstate.<sup>3</sup> Interstate 15 was built in the 1960's with a 20-year design life. Not only has it outlived its service life but also it no longer meets modern traffic engineering or earthquake design standards according to UDOT.<sup>3</sup> In addition, the loads being placed on the highway are expected to increase at a rapid rate as the population of Salt Lake City is expected to

increase from 1,250,000 in 1996 to 1,650,000 by year 2000.<sup>3</sup> All this had Utah travelers concerned as evidenced by market research that showed traffic congestion as one of the top three concerns of Salt Lake area residents.<sup>3</sup>

However, residents will certainly have plenty of maneuvering room after the reconstruction is completed with widening to ten lanes (eight general purpose and two high-occupancy vehicle (HOV) lanes). The HOV lanes will be connected to a new central business district interchange. UDOT officials are hoping this will provide incentives for commuters to carpool as the interchange will only be accessed by the HOV lane and not the general-purpose lanes.

#### **DELIVERY METHOD DECISION (DESIGN-BUILD)**

Knowing that the Interstate required major renovation and reconstruction work it was then a matter to determine the best method to accomplish the construction. Congestion, delays, and angry commuters typically occur with any construction project through urban areas. However, UDOT in attempting to receive public support for the project conducted public surveys that clearly indicated the commuters did not want to endure eight to ten years of lane, ramp and interchange closures and detours. According to Mr. Thomas Warne, UDOT's Executive Director, "They told us that if they had to choose they would prefer more pain but less time."<sup>3</sup> Further, in a state survey of the mayors it was unanimous opinion that it was better to shut down an interchange completely for six months than to partially close it for three years.<sup>4</sup>

The biggest benefit of design-build contracting is that it allows fast-tracking of construction. There is no need to wait until the design drawings are completed, solicitations are performed and bidding completed. One contractor or a joint venture performs the design and the construction with the owner performing the oversight. The design-build strategy can simplify management, reduce conflicts and save time and money by overlapping the design and construction activities.<sup>5</sup>

This is true because the designer and contractor are on the same team which removes potential for adversarial relationships. This allows more efficient constructability input into the project design. Further, the contractor can order long-lead time items based on conceptual designs or partial designs and start construction sooner. The owner also benefits from the design-build method of contracting by reducing resources involved in the project. In contrast to low bid contracting, design-build lends itself to pre-qualification of contractors involved. This empowers the owner towards choosing only the contractors that have the ability and track record of performing successful and quality construction. Mr. Jeffery Beard, the executive director of the Design-Build Institute of America (DBIA) supports the State Government's use of this "new" method of letting contract work. In an interview with Engineering News Record (ENR) he remarked, "State governments have to look beyond low bid, design-build is more efficient and provides a better return to the taxpayers."<sup>5</sup> Of course, he may have some bias as director of DBIA but it is certainly true that using the low bid contracting strategy the contractor has no incentive to do anything but the minimum.

Public agencies have been mandated to use competitive bids as the contracting strategy for construction contracts to prevent favoritism and corruption. Therefore, before UDOT could proceed with the design-build project they needed state legislature permission because design-build is not the traditional contracting strategy. UDOT received the go-ahead in February of 1996 and started formulating the plan for its selection of a design-build highway contractor. They performed a self-evaluation concerning the capacity to manage the planning and execution of such a major contract. The evaluation revealed UDOT had little design-build experience which prompted them to hire a construction management consulting firm (Parson Brinkerhoff Quade & Douglas (PB)) and a law firm (Nossaman, Gurhner, Knox & Elliott). The law firm

provided guidance on the types of procurement processes consistent with a design-build approach because there are several variations in approaches to design/build contracting including:<sup>6</sup>

- Least cost
- Best value
- Sole source
- Amount of preliminary design
- Amount of risk sharing
- Type of specifications

PB along with members of the Federal Highway Administration (FHWA) and DBIA recommended using best value as the selection criteria.<sup>7</sup> Best value means the proposals would be evaluated on the basis of price and technical proposal, not just low bid.

PB (UDOT's project management consultant for the I-15 project), along with several other consultants supplemented UDOT personnel to form the I-15 reconstruction team. Appendix B shows the functional organization used by the I-15 team.

### **CHALLENGES ASSOCIATED WITH DESIGN-BUILD DECISION**

The I-15 team, desiring to be efficient and not "reinvent the wheel" if not necessary searched for existing appropriate design-build provisions and specifications. They reviewed several specifications in hopes of adopting them for the I-15 but determined even the most promising (a toll road project in California) were not similar enough to adopt.<sup>6</sup>

Soon after the decision was made to follow the design-build strategy approvals were requested from the FHWA as a Special Experimental Project (SEP) under SEP-14. The FHWA established Special Experimental Project No. 14 (SEP-14) in 1990 to evaluate innovative

contracting methods. "Under the provisions of SEP-14, UDOT will be required to provide experimental project reports on their experiences with the design-build process."<sup>1</sup> To facilitate the review and approval of the SEP-14 submittal, a Memorandum of Understanding was signed between the Utah Governor and FHWA.

Additional issues that were necessary to coordinate and receive approvals from the FHWA related to Disadvantaged Businesses. Because UDOT anticipated some federal funding for the I-15 project they were required to include project provisions for Disadvantaged Business Enterprise (DBE) quotas. They included specification sections that requested the contractor to "diligently comply" with subcontracting and performance plans regarding the DBE program. DBE program goals were limited to the federally funded portion of project because no requirement existed for state DBE goals. UDOT was unsure on the final amount of federal funding so they assumed \$200 million. Therefore, they decided to set a realistic goal of \$20 million for disadvantaged business. This is 10% of the moderate \$200 million assumed to be federally funded. The FHWA waived the requirement that the bidders submit DBE information (specific names, description of work to be performed and dollar amount) before contract award.<sup>6</sup> Because on such a large contract it was not feasible to submit specific DBE details prior to completing design. Therefore, it is the contractors responsibility to keep records regarding the progress of DBE participation. UDOT required progress reports in January, April, July, and September of each year with very specific information.<sup>8</sup> The FHWA further waived the required 30% work to be performed by the prime contractors called for in the Code of Federal Regulations.

The Salt Lake City chapter of Associated General Contractors (AGC) requested that UDOT include provisions that would require local contractors to receive a specific share of the contract



work. UDOT wanted to accommodate the request but because federal aid is anticipated for the project it precluded a set-aside for local contractors. However, as a compromise the contract did specify that \$100 million of the work be subcontracted. Local contractors should be competitive enough to capture a portion of the work.<sup>1</sup>

## **FUNDING**

Funding for this significant project will be a mixture of public and private financing. Utah's legislature created the Centennial Highway Transportation Fund (CHTF) which is a 10-year program designed to generate funds from the following sources:<sup>9</sup>

- 5% gas tax increase
- Vehicle registration price increase (\$10/vehicle)
- General bonds
- \$200 Million in projected federal funds

Thus far \$14 million in federal funds have been received and \$31 million has been committed.<sup>9</sup>

## **DESIGN-BUILD PROCUREMENT PROCESS**

Typically design-build projects are negotiated contracts with a competitive process. The procedures that UDOT developed to evaluate and select a design-build contractor was modeled after the source selection plan in the Federal Acquisition Regulation (FAR) as shown below:<sup>6</sup>

1. Request for Qualifications (RFQ)
2. Request for Proposals (RFP)
3. Best and Final Offer (BAFO)

Once the procedures were developed UDOT was extremely careful to follow them without distraction. This was critical to ensuring no award protest was filed which could have delayed the project.

The procurement process began by publishing a Letter of Interest (LOI) in the Commerce Business Daily (CBD) and other engineering publications. Although over one hundred firms initially replied to the LOI the numbers soon dwindled drastically. Four contractor teams met with the I-15 team for the informational meeting where project goals, contracting strategies, timelines, questions and suggestions were shared.<sup>6</sup> Although UDOT sent all interested parties the RFQ (those that responded to the LOI and those that attended the informational meeting), only three firms responded by submitting a Statement of Qualification (SOQ). Thirty members on the I-15 team evaluated and rated the SOQ's according to the criteria below:

- Legal and Financial
  - Legal Structure
  - Financial Profile
- Organization and Experience
  - Organization Structure
  - Organization Charts
  - Proposer Experience
  - Key Staff Background and Experience
- Project Approach
  - Project Risk
  - Project Management
  - Project Administration
  - Planning and Execution
- Record of Performance
  - Cost and Schedule Performance
  - Penalties and Termination's

Record of meeting regulatory requirements  
 Change Orders and Claims/Total Project Costs Ratios  
 Experience with Award Fee contract

Rating guidelines were:

Very Highly Qualified

Highly Qualified

Qualified

Marginally Qualified

Not Qualified

Figure 2 identifies the three contractor venture teams that prequalified and the prominent construction and design team members.

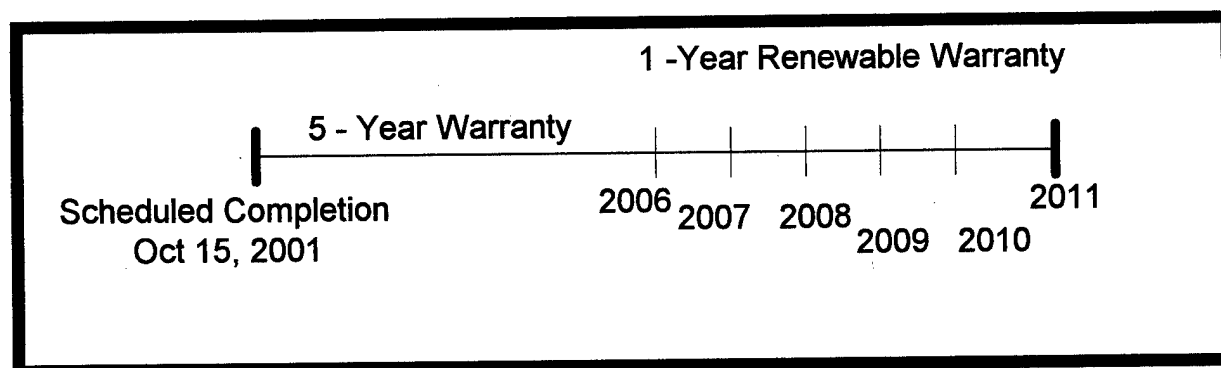
## FIGURE 2: QUALIFIED CONTRACTORS

<u>Lake Bonneville Constructors</u>	<u>Salt Lake Constructors</u>	<u>Wasatch Constructors</u>
Flatiron Structures	Brown & Root	Kiewit Pacific
Fluor Daniel Inc.	H.B. Zachry	Granite Construction
CH2M Hill	HNTB	Sverdrup
HDR Engineering	O'Brien-Kreitzberg	DeLeuw Cather

As UDOT continued to prepare the RFP they simultaneously provided the draft to the qualified proposers for their valuable input into the living document. Discussions were held weekly with teams to answer questions and address concerns on the project. It was during this review and discussion period that the proposers expressed their concern with the long term maintenance.<sup>6</sup> Initially, UDOT wanted 20 years of maintenance (including snow removal) and warranty but the contractors objected to the proposed long-term maintenance requirements and the corresponding long-term warranty. One of the reasons for the objection was a portion of the project is situated in unconsolidated sediments from prehistoric Lake Bonneville, and the long-term maintenance and

warranty were “unsettling” to the prospective bidders. Settlement was a major concern because the traditional surcharge practices would not be practical due to the relatively short contract duration. The contractors were aware that alternative methods would be required but were unwilling to bear the full risk associated with those methods.<sup>7</sup> Because of these concerns UDOT decided to reduce the proposed maintenance and warranty to 5 years with 5-one year renewable options as shown in Figure 3. They also limited the scope of maintenance and warranty and agreed to cost share with the contractor for settlement in excess of the proposed maintenance price.

**FIGURE 3: WARRANTY PERIOD**



The RFP was organized into 21 sections in electronic format and given to prospective bidders on 4 compact discs (Appendix C contains the outline of the entire RFP). “Had the RFP been issued in paper format, there would have been more than 40,000 pages of text and 2,800 engineering drawings. It would have filled more than ten Xerox paper-sized boxes. It would have cost more than \$2,000 per copy to produce and more than \$400 per copy to mail.”<sup>10</sup> In contrast the 4 CD-ROM’s cost \$140 per set.

As shown in Figure 4, a “preview period” was provided by UDOT where the proposers could submit concepts to determine if they were in the performance specification “box.” The proposers requested this review because of the short timeframe between discussions and BAFO. The contractors felt that if the proposals were off base it

**FIGURE 4: PRECONSTRUCTION PHASE TIMELINE**

UDOT and Wasatch Front Regional Council (WFRC) investigate what improvements needed.	1984
Utah Transportation Commission adopted Alternative Analysis/Draft Environmental Impact Statement	1990
General Development Plan began Executive Summary Technical Report Concept Drawings Supplemental Environmental Impact Statement Final EIS Record of Decision	1992     Jun 1996 Aug 21, 1996
Received Legislature Approval to use Design-Build	Feb 1996
Issue Request for Proposals	Oct 1, 1996
Environmental Information Meeting	Oct 15, 1996
Review of Proposers Technical Concepts - Optional	 Dec 1, 1996
Submit Form Q (optional) by Proposers	Nov 1, 1996
Submit Draft Emissions Control Plans (ECP) to Division of Air Quality by Proposers	 Nov 15, 1996
Submit Recommended Changes to RFP Provision Deadline	 Nov 15, 1996
Issue Revised Right-of Way (ROW)	
Acquisition Schedule by Department	Nov 22, 1996
Response to Technical Concepts by Department	Two (2) weeks after receipt from proposer
Requests for Clarification Deadline	Dec 9, 1996
Addenda and Clarification Notices Final Date	Dec 16, 1996
Approval of ECP Final Date	Jan 10, 1997

would not allow sufficient recovery time before the BAFO deadline.<sup>6</sup> Although, the proposers requested the previews they were apprehensive of releasing their engineered solutions for fear of leaking the technology, etc. However, UDOT eased the contractors concerns by performing “blind” reviews (those that reviewed the concepts did not know

the identity of the proposer). Information in text, logos, and anything that identified the proposer or organization had to be removed.

## **IV. SELECTION PROCESS**

All proposers were required to give an oral presentation of their initial technical proposals. This allowed the contractors to highlight the significant aspects of their proposals and communicate orally their understanding of the RFP. UDOT used the information gained during these presentations to assist in the evaluation of the technical proposals.

### **EVALUATION FACTORS**

Evaluation Factors for technical and price proposals were approximately equal in weight. The technical proposal included four technical factors listed in descending order of importance:<sup>11</sup>

1. Technical Solutions;
2. Work Plan/Schedule;
3. Management; and
4. Organizational Qualifications.

Further, the technical solutions were divided into six sub-factors. All of which had equal weight:

1. Maintenance of Traffic;
2. Geotechnical;
3. Structures;
4. Pavement;
5. Maintainability; and
6. Others (in three levels of significance)

ATMS was included in the high level of significance with Drainage and Water Quality and Roadway Geometrics as sub-

categories. Aesthetics was included in the intermediate category with Lighting, Traffic Signals and Signing as sub-categories. Concrete Barriers and Harmful/Hazardous Materials Remediation were included in the low category.

Figure 5 below shows the adjectival ratings that UDOT used to evaluate the proposals following the oral presentations.

#### FIGURE 5: EVALUATION RATINGS

- **EXCEPTIONAL:** The proposer has demonstrated an approach which is considered to significantly exceed stated requirements/objectives in a beneficial way and provides a consistently outstanding level of quality. There is very little or no risk that this proposer would fail to meet the requirements of the solicitation. There are essentially no weaknesses.
- **GOOD:** The proposer has demonstrated an approach which is considered to exceed stated requirements/objectives and offers a generally better than acceptable quality. There is little risk that this proposer would fail to meet the requirements of the solicitation. Weaknesses, if any, are very minor.
- **ACCEPTABLE:** The proposer has demonstrated an approach which is considered to meet the stated requirements/objectives and has an acceptable level of quality. The proposal demonstrates a reasonable probability of success. Weaknesses are minor and can be readily corrected.
- **SUSCEPTIBLE TO BECOMING ACCEPTABLE:** The proposer has demonstrated an approach which fails to meet stated requirements/objectives as there are weaknesses and/or deficiencies, but they are susceptible to correction through discussion. The response is considered marginal in terms of the basic content and/or amount of information provided for evaluation but overall the proposer is capable of providing an acceptable or better proposal.
- **UNACCEPTABLE:** The proposer has demonstrated an approach which contains significant weaknesses/deficiencies and/or unacceptable quality. The proposal fails to meet the stated requirements/objectives and/or lacks essential information and is conflicting and/or unproductive. There is no reasonable likelihood of success; weaknesses/deficiencies are so major and/or extensive that a major revision to the proposal would be necessary.

Table 2 below includes some significant characteristics that UDOT used to evaluate the technical proposals. The complete listing of UDOT's Technical Evaluation Criteria is included in Appendix D.



**TABLE 2: TECHNICAL EVALUATION FACTORS WITH KEY CRITERIA**

<b>TECHNICAL SOLUTIONS</b>	Geotechnical distress monitoring of structures, Snow/Ice Removal, Vandalism/Graffiti, Safety/Glare Control, Innovation, Creativity, Sustainability, Cost Effectiveness.
<b>WORK PLAN /SCHEDULE</b>	Meet deadlines, Clarity of WBS, Proper Logic, Reasonable Durations/Productivity.
<b>MANAGEMENT</b>	Quality Management Program (ISO 9000 registration), Community Relations, Safety Management, Control/Coordination of Subs, Organization Structures, Cost/Schedule Control.
<b>ORGANIZATIONAL QUALIFICATIONS</b>	Past Performance, Experience, Legal and Financial, Project Approach.

## PROPOSAL EVALUATIONS

Once the proposals were evaluated UDOT meet with each proposer to discuss some of the shortcomings of the proposals as well as seeking clarifications. The intent was to allow the contractors to improve their proposal and provide a Best And Final Offer (BAFO). Again, UDOT performed blind evaluations of the technical proposals.

Price was evaluated separately on the basis of net present value with the following categories: Base price (engineering and construction) including Hazmat remediation and ten option packages (shown in Appendix E)). The proposers were required to provide a price for all options without any time extension of the guaranteed completion date of October 15, 2001. The total price for all ten option packages were added to the Base Price for evaluation purposes. Although award was for the base price, evaluation of price was based on options, hazardous/harmful remediation and a future change order modification to ensure competitive change order rates. The four components of the price proposal were brought to present values for analysis (Net Present Value). All proposers

were required to submit an early start cost curve which would represent the maximum payment schedule and a late start cost curve which would represent the minimum performance schedule acceptable.<sup>6</sup>

Because of the subjective nature of using best value contracting strategies it is vital that no bias is introduced into the selection process. UDOT went to great lengths to ensure fairness, confidentiality, and safeguarding of information during the evaluation process. All UDOT personnel associated with the selection process were required to sign a certification of confidentiality and non-disclosure statement. UDOT established a written evaluation and selection procedure that separated evaluation of technical and price proposals and retained the separation until the technical and price evaluations were made and recommendations submitted to a high-level board that evaluated the combined technical/price proposal and made its recommendation to the selection official. The overall evaluation and selection process included: fourteen specialty teams evaluating the technical proposals and specific criteria concerning formatting of proposals to ensure they could not be identified to a particular proposer (blind reviews). Similarly, the price evaluation team was not given the names of the bidders associated with the proposals. In total, 63 UDOT officials were involved in the evaluation which included six members on the final evaluation team.<sup>12</sup> Only the team members on the final evaluation were provided all the proposal pieces and knew the final outcome.<sup>13</sup> Even after all the above safeguards were instituted for ensuring non-bias selection UDOT brought in four observers to participate (not just witness) the final selection. These were members from the State Transportation Commission, State Administration and State Legislature who all unanimously validated the selection.<sup>6</sup>

## BEST VALUE SELECTION

Although price was very important, UDOT considered time and quality paramount to the projects success. Therefore, using performance specifications coupled with an excellent technical evaluation process based on quality ensured the best proposal and contractor was selected that gave the best value to the taxpayers of Utah.<sup>14</sup> An overview of the selection process is outlined in Figure 6.

### FIGURE 6: SELECTION PROCESS STEPS

- Department receives initial proposals; reviews for responsiveness; separates technical and price proposals; prepares for evaluation.
- Initial Oral presentations made.
- Technical proposals evaluated; ratings assigned for technical factors and overall rating assigned for each proposers technical proposal.
- Price proposals examined and evaluated separately and apart from technical proposals.
- Relationship of price and technical proposal considered and recommendations made regarding competitive range and need for discussions.
- If decided by selection official, discussions held with all proposers.
- Department requests BAFOs.
- Department receives BAFO proposals; evaluations repeated considering new proposal technical information and price.
- Department performs integrated assessment of price and the ratings of the technical factors and recommends selection of the proposer providing the best value to the state taxpayers.
- Selection official chooses for award the proposal which offers the best value to the proposer providing the best value to the state taxpayers.

Table 3 below shows the price proposals from the three contractor teams. As can be seen there was less than 2% delta between Wasatch and Salt Lake Constructors proposals.

**TABLE 3: PROPOSERS BID PRICES**

PROPOSERS	BID PRICE (Billion)
Wasatch	\$1.469
Salt Lake Constructors	\$1.438
Lake Bonneville	\$1.487

**TABLE 4: PROPOSERS EVALUATION MATRIX**

**Technical Factors**  
Descending Order of Importance

Proposer	TEB	Org. Quals	Mgmt	Work Plan/ Schedule	Technical Solutions
Lake Bonneville	A+	A+	G+	A-	A+
Salt Lake	G-	G+	G+	A+	G-
Wasatch	E-	E	E-	G+	E-

**Technical Subfactors**  
Equal Weight

Proposer	Technical Solutions	MOT	Geotech	Pavement	Structures	Maint	Other
Lake Bonneville	A+	A	A	A	G+	A-	G
Salt Lake	G-	A-	G	G	E-	A+	A+
Wasatch	E-	E	G+	E-	G+	E	E-

**Other Technical Subfactors**

High Significance      Med. Significance      Low Significance

Proposer	Other	ATMS	Drainage/ W.Q.	Roadway Geometry	Aesthetics	Lighting/Si gnal/Signs	H/H Material Remediation	Concrete Barriers
Lake Bonneville	G	E-	A+	A	G	G	E-	G
Salt Lake	A+	A-	A	G	A	A+	E-	G
Wasatch	E-	E-	G+	E	E	A	A	G+

## WINNING PROPOSAL

The lowest proposal was submitted by Salt Lake Constructors. However, based on price and other factors (technical evaluation shown in Table 4) the project was awarded to Wasatch Constructors. The highest bid was submitted by Lake Bonneville team composed of Brown & Root, HTNB Corp and O'Brien-Krietzberg.

Wasatch Constructors is a joint venture of Kiewit Construction Company, Granite Construction and Washington Construction plus a consortium of contractors and engineering design companies as shown in Figure 7. Wasatch constructors were the only

**FIGURE 7: WASATCH VENTURE TEAM**



contractors that received an exceptional rating. The Wasatch team is led by Kiewit Construction which is one of the largest general contractors in North America. In 1995, ENR rated Kiewit as the top transportation contractor in North America with average revenues of more than \$2 billion.<sup>15</sup> Additionally, Kiewit holds a Standard and Poor's

credit rating of A+. Granite Construction is a heavy civil contractor and construction material producer. Also in 1995, they were ranked as the third largest transportation contractor in North America. The Wasatch team is not merely a conglomeration of large construction firms; they have a proven track record as well. The recent outstanding performance on a similar design build project that won them an award, further supported and lended credibility to their proposal on the I-15 project. Kiewit, Granite and DeLeuw, Cather teamed to complete a similar design-build \$750 million San Joaquin toll road in California three months before the scheduled completion date, under budget and without claims against the owner.<sup>12</sup> This was inspite of a 17 month environmental stoppage.

Wasatch proposed all mainline and interchange work would be complete and open by May 2001 – five months early. Further, they guaranteed substantial completion of the entire I-15 project three months ahead of schedule plus showed great attention to future maintenance, which received high marks.<sup>16</sup> Their proposal included an innovative traffic management plan and alternate route strategies that featured:<sup>3</sup>

- Re-stripping the southwestern leg of the I-215 Belt Route which would provide an extra lane of traffic during construction.
- Using advanced traffic management systems to aid congestion.
- Initiate a public information effort to reduce peak-hour traffic volume by 10%.

Keeping an extra lane open in each direction during construction differentiated their proposal from the others. Additionally, their proposal included the following geotechnical work: lime cement columns under high fills and retaining walls to strengthen the silty, sandy soils and wick drains and grout tubes under the pavement near bridges.

To further efficient project management and partnering with the owners, Wasatch proposed co-locating the entire I-15 management team under one roof including: UDOT, UDOT consultants, designers and constructors. This central office would be the “Hub” to the other three construction segment offices located along the I-15 corridor. Actually, Wasatch proposed the project be split into three construction work segments (Downtown, Jordan and Cottonwood) with a total of over 1500 schedule activities each. The three segments each contained one freeway-to-freeway junction as shown in Appendix F. They proposed to operate each segment as its own construction “sub-project” with separate plans for management, resources, equipment, materials and labor.<sup>16</sup> Appendix G contains Wasatch’s proposed organization chart with key personnel assigned.

As a review figure 8 contains the selection process timeline.

#### **FIGURE 8: SELECTION PROCESS TIMELINE**

Initial Proposal Due Date	Jan 15, 1997
Oral Presentations (one-week in length)	Jan 20, 1997
Review of Complete Proposals	Feb 7, 1997
Start Discussions (if any) with Proposers	Feb 12, 1997
End Discussions with Proposers	Feb 21, 1997
Publish Addendum and/or Request Best and Final Offer (BAFO)	Feb 21, 1997
BAFO Due Date	Mar 7, 1997
Complete Evaluations/Selection	Mar 25, 1997
Award Contract	Apr 15, 1997

## V. PRE-PROJECT PLANNING

It is reality that all projects involve risk factors for the owner and contractor but with such an aggressive schedule stipulated for the State project, risk reduction and allocation was paramount. UDOT reduced some risk associated with the project by performing Pre-Project Planning that included:

- Investigating major permitting needs and obtaining required permits;
- Completion of 15% of detailed drawings including corridor layout with plan and profile design which identified necessary right-of-way acquisition;
- Initial negotiations with utility companies and railroad companies;
- Geotechnical investigations; and
- One hundred percent design drawings on critical features.

The preliminary design was labeled phase I design. Certain aspects were advanced to the preliminary stage and others to near completion.<sup>17</sup> These aspects were considered critical and included: railroad grade separation structures, frontage roads, viaducts, utility conflicts and coordination with owners, conflicts with railroad facilities, right-of-way easement acquisition and geotechnical studies and approximate limits of work. UDOT gave the contractor the choice to use or not to use the phase I designs. If they chose, however, not to use the drawings there would not be any adjustment to the contract price or time.

### UTILITY

UDOT performed the preliminary coordination with the numerous utility companies that own the approximate 1,500 utility crossings in the corridor. Approximately 600 of these utilities pose potential conflict with the proposed construction. With over 36 different utility owners (shown below in Table 5) early and substantial coordination was



vital to project success. The critical nature of this work was recognized with the need for a separate schedule just for utilities and railroad work.

**TABLE 5: UTILITY OWNERS**

Cahoon & Maxfield Irrigation Company	Murray Irrigation Company
Insight Cable Television	Union & East Jordan Irrigation Company
Midvale City	Qwest
Mountain Fuel Supply Company	AMOCO Oil Company
Murray City Sewer / Water	Electric Lightwave
Murray City Power – Operations	Phoenix Fiber Link
Salt Lake City – Dept. of Public Utilities	Teleport Communications Group
Salt Lake City Suburban Sanitary Dist #1	Greenstar Telecommunications
Salt Lake City Suburban San Sewer Dist #2	Cottonwood Improvement Dist.
Salt Lake County	Union Jordan Irrigation Company
Salt Lake County Sewer Imp. Dist #1	UDOT
Salt Lake County Sub. San. Sewer Dist #2	US West Communications
Sandy City	Utah Power
Sandy Suburban Imp. District	AT&T
City of South Jordan	MCI
South Salt Lake City	US Sprint
TCI Cablevision	Bell Canyon Irrigation Company
East Jordan Irrigation Company	Big Ditch Irrigation Company

Using a performance specification, UDOT placed the responsibility to identify and resolve all utility conflicts including construction coordination, relocation, removal and/or protection of the affected utility on the contractor.<sup>18</sup> Three types of work is involved with utilities. The contractor is required to:

- Coordinate its efforts with those Utility Owners who will perform their own design and construction.

- Coordinate its efforts with those Utility Owners who will perform their own design, and construct the utility facilities as designed.
- Coordinate its efforts with the applicable Utility Owners and perform the design and construction of all other relocations, protection in place and new facilities required for the project.

Part of the planning work that UDOT performed with the utility companies involved communicating the concerns, constraints, and preferences of the owners. For instance, many of the utility owners have specific contractors that are qualified to perform their work and therefore UDOT included in the RFP the pre-qualified contractor lists as specified by the utility owners.

## **RAILROADS**

The project calls for the construction and/or renovation of numerous railroad overpasses and underpasses. In addition, relocation of several miles of railroad tracks.<sup>8</sup> Although UDOT did perform preliminary coordination with the railroad companies, the contractor is responsible for the final agreements and any delays associated with that coordination work. Railroad owners included: Union Pacific Railroad, Southern Pacific Lines, and the Utah Transit Authority. To further complicate coordination, the Pacific and Southern Pacific railroads were consolidating at this same timeframe. The Railroads acknowledged their willingness to accommodate the I-15 reconstruction, however, they dictated the schedule for railroad related work by providing working windows for demolition and construction. The contractor was required to develop plans for each utility crossing the railroad and the associated crossing permits for 19 locations.<sup>19</sup>

## RIGHT- OF-WAYS

Although not all the right-of-ways were negotiated and purchased before the RFP was issued, UDOT will be purchasing all right-of-ways. A schedule was established with required land purchases identified and if UDOT does not provide the right-of-way to the contractor by the specified date then they are liable for delay costs.

In order to accomplish the expansion and reconfiguration of the interstate approximately 277 parcels of land were acquired as shown in Table 6 below.<sup>20</sup>

**TABLE 6: RIGHT-OF-WAY ACQUISITIONS**

Location	Total Parcels
I-15 Corridor	162
9000 South Frontage Road	47
600 North/I-15 Interchange	15
600 North Railroad Viaduct	24
Railroad grade separations	27

Several real estate subcontracts were let by UDOT to perform the appraisal, acquisition, and property management necessary to acquire these ROW's and parcels. The contractor was responsible for demolishing all buildings and structures on the parcels acquired. This included investigation of and removal of harmful/hazardous materials.

## **VI. CONTRACT PROVISIONS**

### **STIPEND**

While UDOT was certainly impressed with the Wasatch proposal they were equally impressed with portions of the other two proposals as well. In fact, they incorporated parts of their proposals into the project. "We paid them a stipend partly to offset their tremendous expenses, and partly so we would own the ideas in the proposal," says Mr. Thomas Warne, UDOT Executive Director.<sup>12</sup> Both unsuccessful, responsive bidders were paid \$950,000. Although initially the stipends were intended to cover one-half of the proposal development costs, realistically it probably provided reimbursement for one-third of the bidders proposal development costs.

### **QUALITY CONTROL/ASSURANCE**

Many public agencies typically hold the contractor responsible for the quality control program but retain the quality assurance duties. However, this is another case of uniqueness with the I-15 project. Here the contractor has overall responsibility for both quality control and quality assurance with UDOT performing oversight of the quality assurance activity. Oversight will include verification of sampling and testing, independent and assurance sampling and testing, review of progress payments and oversight of the contractor's construction management controls.<sup>3</sup> Similar to other large contracts the QC program is required to be "independent" from Quality Assurance (QA).<sup>6</sup>

The RFP required the contractor to submit a comprehensive quality control and quality assurance program complete with plans to attain International Standards Organization (ISO) 9001 registration following award. UDOT used a variety of resources to assist in creating the performance specifications including experts from highly recognized associations, academia and consults both within and outside the state.

A blend of performance specifications and prescriptive specifications were used in the RFP as a foundation for building a quality, long-lasting project. Performance specifications coupled with long-term warranties enticed the contractors to use life-cycle-cost analysis of all design and construction options. Table 7 below shows an example of life cycle analysis performed on a bridge structure from Wasatch's initial proposal.

**TABLE 7: SAMPLE LIFE-CYCLE COST ANALYSIS (Structural Steel Girder-Post Tensioned Concrete Deck)**

ITEM	COST	TYPE	YEAR	PRESENT WORTH	PW PER SQ m
Initial Construction	\$1,222,400	Lump sum at	0	\$1,222,400	\$955.00
Paint Steel	\$30,000	Lump sum at	15	\$16,658	\$13.01
	\$30,000	Lump sum at	30	\$9,250	\$7.23
	\$30,000	Lump sum at	45	\$5,136	\$4.01
	\$30,000	Lump sum at	60	\$2,852	\$2.23
Maint.Rail/Deck/DeckOverlay	\$10,000	Per year for	75	\$236,804	\$185.00
Replace Deck/Joints	\$232,000	Lump sum at	45	\$39,718	\$31.03
Replace Overlay/Joints	\$70,000	Lump sum at	15	\$38,868	\$30.37
	\$70,000	Lump sum at	30	\$21,582	\$16.86
	\$70,000	Lump sum at	60	\$6,654	\$5.20
TOTAL				\$1,599,836	\$1,250

UDOT referred to the performance specifications as a "box". The "box" represented the perimeter which all solutions and designs had to meet. Typically, nationally accepted codes or AASHTO criteria were used for the performance box.<sup>6</sup> Long-term performance of any project depends not only on the proper design but is dependent upon adequate control during construction. To ensure the projected design life of 40 years for roadway and 75 years for high-performance bridge decks requires tight field control.

Bridge deck concrete construction incorporated silica fume and dense concrete to provide long-lasting high strength/high performance concrete decks. Additionally, silane

sealants, double corrosion protection for post-tensioned deck slabs, abutment and bent cap coatings and annual deck washing was used to ensure the structures withstand the harsh winter environment. The bridges were designed according to new earthquake standards, widened and lengthened to accommodate new safety distances. To aid in protecting bridge structures from chemical attack due to de-icing salts, Wasatch proposed the use of spliced, post-tensioned girders versus steel girders. These are being used at SPUI's where spans exceeded 60 meters.<sup>16</sup> Additionally, transversely post-tensioned concrete decks were proposed that provided the benefit of reducing cracking in the bridge deck and, therefore, reducing the potential for chemical attack on the embedded steel.

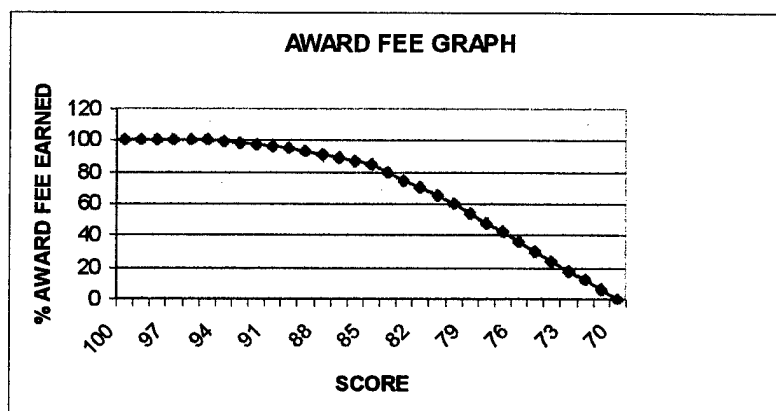
#### **AWARD FEE/INCENTIVES**

Integral to the QA planning performed by UDOT is the incentive fee or award fee program. It is UDOT's desire that the contractor performs the work in such an outstanding manner that it warrants the highest rating and the corresponding award fee. This will result in a win-win solution for the contractor, UDOT, and most importantly the traveling public.<sup>21</sup> Throughout the life of the contract, the contractor has the potential to earn bonuses totaling \$50 million. The program is structured around nine time intervals (every 6 months), with a \$5 million maximum per increment (except the first and last period). Awards relate to timely performance and three criteria elements including: quality construction, maintenance of traffic, and public communication.<sup>22</sup> Table 8 below shows the award fee distribution.

**TABLE 8: AWARD FEE DISTRIBUTION**

Period	Period Covered	Timely Performance	Other Three Criteria Elements	
1	NTP - 9/30/97	\$500,000	\$2,000,000	
2	10/1/97 - 3/31/98	\$1,750,000	\$3,250,000	
3	4/1/98 - 9/30/98	\$1,750,000	\$3,250,000	
4	10/1/98 - 3/31/99	\$1,750,000	\$3,250,000	
5	4/1/99 - 9/30/99	\$1,750,000	\$3,250,000	
6	10/1/99 - 3/31/00	\$1,750,000	\$3,250,000	
7	4/1/00 - 9/30/00	\$1,750,000	\$3,250,000	
8	10/1/00 - 3/31/01	\$1,750,000	\$3,250,000	
9	4/1/01 - Complete	\$3,375,000	\$4,125,000	
	Supplemental Award Fee For Early Completion	\$ 5,000,000		
<b>TOTAL</b>		<b>\$21,125,000</b>	<b>\$28,875,000</b>	<b>\$50,000.00 TOTAL</b>

The award fees can be earned in whole or in part by the contractor based upon the evaluation approval of the contractor's work by UDOT's Fee Determination Official (FDO). The FDO is the Executive Director of UDOT (Thomas Warne). In order to receive the award fee, the contractor must receive a numerical rating of seventy points or better for both the individual percentage score for timely performance and the total evaluation score for the other three criteria elements (Quality of Work, Management, Communication Relations/Maintenance of Traffic). Figure 9 shows the correlation between award fee score and percent award fee earned.

**FIGURE 9: AWARD FEE vs. SCORE**

A three-tier organization was created to control the award fee program as shown in Appendix H.<sup>22</sup> The first tier includes both contractor and UDOT performance evaluators who work with performance monitors to observe, document and perform a qualitative assessment of the contractors performance on the project following a specified evaluation process. The second tier is an award fee oversight committee with representation from UDOT and the contractor including UDOT's project director and deputy, the contractor's principal on-site and deputy project director. The committee is a review entity for the data that the performance evaluators and monitors compile. Further, the oversight committee will analyze and resolve any scoring disagreements and keep the FDO informed of the status of the process by submitting interim and final Award Fee Summary Reports. As an example, Appendix I contains the Award Fee Summary Report for AFDP 1 with the appropriate supporting audit forms, worksheets and scoring tables. The third tier and ultimate approval is the Fee Determination Official (FDO), UDOT's Executive Director. If the oversight committee fails to resolve any conflicts or disagreement concerning the scoring the FDO will resolve the dispute. Appendix J shows the award fee criteria sub-element guidelines and Appendix K contains flow charts of the award fee process.

### **LIQUIDATED DAMAGES**

The project is proceeding so successfully damages due to late completion most likely will not be assessed. However, UDOT did include these provisions as standard owner protection at \$20,000/day. Additionally, stipulated damages of \$10,000/day may be levied for failure to achieve final acceptance of the project within 60 days after substantial completion.<sup>23</sup>



Liquidated damages must resemble actual costs resulting from late completion of construction and cannot be used as a penalty. However, with a project of this visibility and significance it is difficult to precisely quantify monetary impact to the traveling public for late completion. Nonetheless, UDOT included liquidated damages in the amounts discussed above as the represented benefit the public will be missing and is calculated based on lane-kilometers. The projected damages were subdivided into rate zones that included: mainline general purpose lanes, HOV and auxiliary lanes, collector – distributor roads, ramps/viaducts and interchange cross streets, and frontage roads and non-interchange cross streets. The damages were further varied for the location within the zones.

#### **ATMS**

UDOT is also pursuing a separate 5-year contract in conjunction with the I-15 project for a Salt Lake City metropolitan area Advanced Traffic Management System to manage the transportation network. The Valley Wide system is being implemented by four contracts, of which the I-15 project is one. The first contract concerns selecting vendor field equipment and communications systems which will be installed under the second contract (the I-15 reconstruction project). The third contract includes traffic control software for the three traffic operations centers located in the valley. The last contract will construct UDOT's traffic operations center.<sup>24</sup>

The entire ATM system is estimated to cost \$50 million but only a portion will be installed in the I-15 corridor. The proposal calls for furnished equipment, programming controllers, and field inspections and training for UDOT personnel. Equipment will include: vehicle detectors, signal controllers, variable message signs, closed circuit TV assemblies to name a few. Some of the equipment installed will be used to report and

assist in easing traffic congestion during the I-15 construction period. Variable message signs and advisory radio to inform drivers on conditions and alternative routes were used. Ramp meters will be used at strategic locations to control the flow of traffic.

The traffic management system is based on the one used in Atlanta to assist motorists in finding the appropriate sports venues during the 1996 Olympics.<sup>25</sup> Of course, after the Salt Lake Olympic games are over the system will benefit the commuters for years to follow.

Fiber optic cables placed along I-15 will tie 130 close circuit cameras, ramp meters and variable message signs into three traffic control centers. Traffic managers for UDOT will monitor flow and dispatch emergency vehicles to deal with vehicle stalls and accidents. Additionally, three road weather stations will be installed that monitor temperature and weather conditions along the I-15 corridor.<sup>25</sup>

## **BONDS**

The surety bond requirements for the project included \$250 million performance bond and \$150 million payment bond for the design/build phase of the contract.<sup>26</sup> Additionally, performance security was required for the maintenance term and UDOT linked the release of the payment and performance bond to the submission of the maintenance bond after one year from substantial completion. The reason for the maintenance bond is to guarantee performance and payment for the maintenance work during the initial maintenance term. The amount of the bond was the amount of the maintenance price (escalated based on index in effect for the first year of the maintenance term) for the highest priced year in the initial maintenance term.

## PUBLIC RELATIONS

The commuters' top concerns included worsening congestion, safety and availability of information related to the construction of the I-15 project. Therefore, UDOT included performance specifications to increase the stakeholders (taxpayers) satisfaction by keeping commuters well informed and educated about the project daily, short-term, and long-term, so they can see the end-product benefits, understand the need and be aware of the timing and the inconvenience to be expected.<sup>27</sup> Because of this UDOT's had three objectives for the community relations program:

- 1) Respond to requests for information;
- 2) Build project understanding; and
- 3) Address important public issues.

To help attain these objectives UDOT via the RFP required the contractor to assign as one of the contractor's "key personnel," a full-time public information specialist responsible for managing the contractors public information activities. Meetings with city and county representatives were projected every two weeks.

Way before the construction began, UDOT involved the general public in the project. "Approximately 80 meetings were held between 1993 and 1995 with the general public and groups such as the Salt Lake City Downtown Alliance, Salt Lake City Planning Commission, Chambers of Commerce, City Councils and the Utah State Legislature."<sup>28</sup> Beginning in January 1995 through June 1995 a public relations consultant (hired by UDOT) conducted both qualitative and quantitative research to measure the opinions of numerous focus groups (State Legislatures, key customer and stakeholders groups, including the public). The research helped UDOT develop a strategic plan for baseline performance and customer satisfaction. In May 1996, the

consultant formulated a Public Information Action Plan. This plan included a multi-faceted strategy for public awareness, communication and support both before and during the reconstruction period. Additional research was performed and became the basis for the performance specification regarding communication. The specification detailed the research results and formulated objectives based on those results which both the contractor and UDOT would work as a team to achieve. Market research included commuters, impacted local businesses, off-corridor business, large employers, delivery/motor carriers, utility companies, local contractors, public agencies and environmentalist groups, city councils and county reps and mayors. The objectives included meeting the concerns of the focus groups and incorporating solutions into the contractor's proposal. For example, from RFP Section 17.2.2.2.1, the market research on *Impacted Local*

*Business* had the following findings:

- I-15 reconstruction plans are critical to their businesses, directly or indirectly.
- Reconstruction will affect traffic patterns and flow in and out of their property.
- Businesses are not sure how they will be financially impacted.
- Relocation is not an option for many businesses due to the necessity of having access to rail lines and trucking routes.
- They want to know how they will receive their deliveries and shipments in a timely manner.
- There is a legitimate concern as to how employees will get to work and the cost associated with having to pay overtime to workers who are forced to cover for late employees.
- Prior to any reconstruction, they want to be informed well in advance when the roads will be impacted, which roads, and how long they will be impacted.

- Strong leadership and planning is crucial.
- Knowing the exact plans, with specifics of how the project will directly impact their businesses, is information they want to know. Timelines are needed immediately to help with inventory planning and other necessary business matters.

UDOT developed the following objective and the strategies shown in Table 9 from the above results.

**Educate and inform businesses as to the scope of the reconstruction project and keep them informed throughout the various stages to minimize the concern and possible negative impact to their businesses.**

**TABLE 9: PUBLIC RELATIONS STRATEGIES FOR IMPACTED LOCAL BUSINESS**

STRATEGIES	RESPONSIBILITY	
	LEAD	SUPPORT
Have personal contact on a regular basis.	UDOT	Contractor
Signage	Contractor	UDOT
Maps	Contractor	UDOT
Have a key contact person(s) making regular visits to all	Contractor	UDOT
Personal letter from the leaders of the project	UDOT	Contractor
Direct Mailer	Contractor	UDOT
Newspaper Ads	UDOT	Contractor
Information Packet	Contractor	UDOT

Besides providing information to commuters concerning closed ramps and other construction information the public information program was designed to reduce travel in the corridor during the normal peak hours through ride sharing, alternate work schedules and public transportation use. Appendix L contains a sample I-15 newsletter that UDOT used as a mailer to distribute vital information to the Salt Lake community and commuters.

## FULL-SCALE RESEARCH

Nothing is more exciting than testing a full-scale model. You get to load a structure until it fails and the best part is nobody gets hurt and you do not get fired! UDOT in cooperation with the Federal Highway Administration and researchers from three Universities asked the contractor to voluntarily participate in full-scale destructive testing on some of the bridges and pavements along the corridor. The research is being conducted under an \$8 million, four-year program funded by the Federal Highway Administration. The contractor was to identify the bridges and pavement sections to be made available to UDOT with only one exception – not to be on the critical path. Testing would be used to validate design assumptions regarding load capacity and seismic resistance to better predict the remaining service life of similar facilities throughout Utah.<sup>29</sup> Studies will center on compacted-aggregate geopiers; including carbon-fiber wrapping and epoxy resin coating and whether these technologies have the proper strength to support heavy highway structures. A recent test used nearly one hundred sensors to record strain during shake testing of an old overpass. A force of 400,000 lbs. was used and displacements of 11.5 inches were recorded.<sup>30</sup>

Table 10 contains the research areas for the destructive testing program.

**TABLE 10: RESEARCH AREAS**

Foundation	Selected pile foundations will be tested to determine present capacity
Pile Load	Selected pile foundations will be tested vertically and laterally
Composite	Different composite materials and application methods tested
Pavement	Nondestructive testing will be compared to destructive testing
Seismic Isolation	Selected bridges will be seismically isolated using different techniques
Deck/Structure	Severely deteriorated structures will be tested to determine ultimate strength
Push-Over	Structures will be tested to failure to determine ultimate strength

## SOFTWARE REQUIREMENTS

Because of the enormity of the job and quick pace an accurate record of all project interaction is crucial to the success of the joint venture. PB had the responsibility to recommend and implement a project management tool that would support the varied activities and needs of such a large project.<sup>31</sup> System goals included:

- Flexibility
- Versatile/powerful
- User friendly
- Minimize paper
- Maximize the use of electronic technology
- Minimize training time
- Accommodate both electronic and paper input and
- Provide the necessary security

Security of data is a concern of any project but especially with the I-15 project because approximately 350 people would be interacting with the construction management software (50 from UDOT and PB and 300 from Wasatch).<sup>31</sup> With so many peoples "hands in pie" the quality of data and potential for corruption of data was a realistic concern. However, PB did not want to limit the access to valuable and necessary information needed to perform efficient project management. Therefore, to provide all users with maximum access to the project files but maintain the necessary security, numerous systems were provided that had both read and write access but only one central computer that had write-only capacity. This computer was designated as the project record and only official submittals would be written to the database.

After considering several management programs including the proprietary systems that were unique to each organization PB recommended using the off-the-shelf version of Primavera System's Expedition contract control software.<sup>31</sup> Some of the customizable features of the software were limited to ensure consistency throughout the users. In fact, templates were created on all individual computers for submittals, change orders, drawings and revisions, and general correspondence. The standardizing of formats and setting procedures for using and interacting with the system ensured compatibility and consistency of the project record. Other software required by the RFP is listed in Table 11.<sup>32</sup>

**TABLE 11: SOFTWARE REQUIREMENTS**

<b>SUBJECT</b>	<b>SOFTWARE</b>
Scheduling	Primavera Project Planner
Project Management	Primavera Expedition
CADD File Viewing	MicroStation Power Scope
MOT and ATMS	MINUTP by Comsis, FREQ, Integration
Pavement	DARWIN, PAS
Geotechnical	LPILE, COM-624, GROUP
Structures	MicroStation by Intergraph
Roadway	Inroads by Intergraph
Drainage	HEC-1
Signals	Highway Capacity Software by McTrans Passer II by McTrans Traf Netsim by McTrans
Document Control	Folio Views Omni Page by Caere
Word Processing/Spreadsheets	Microsoft Word/Excel



## **SALVAGED EQUIPMENT**

With such a large project it is amazing that UDOT has not omitted large portions of work. However, not only have they covered the required new work but had the forethought to require the contractor to salvage some equipment for the Department. In specification section 2.1.4 (Construction Scope of Work), it stated that the contractor should deliver to UDOT at a designated site within the county the following material salvaged from the I-15 corridor:

- Impact attenuators
- Movable concrete barriers
- Cobra light poles
- Luminaries
- Traffic signals
- Cantilever sign structures
- Pumps

Additionally, they specified any material with lead-based paint shall not be salvaged nor delivered to the Department.

## **VII. RISK**

Proper allocation of risk is critical to a project's success. There is a tendency with design-build contracting to place all of the risk on the contractor. However, UDOT was aware that risk equates to contingencies of both time and money. Therefore, they proposed risk sharing of several entities including fuel adjustments, geotechnical conditions, environmental and right-of-way.

### **FUEL ADJUSTMENT**

Because the project included 26 km of highway reconstruction, equipment costs and in turn fuel costs were a major cost of construction. To manage some of the contractor's and UDOT's risk for the potential varying crude oil prices and the affect it could have on project cost, a fuel price adjustment clause based on an assumed quantity of fuel per thousand dollars in construction cost was included in the contract. After the BAFO's were submitted UDOT determined the average base price per barrel of crude oil from the Wall Street Journal using the average spot price for the preceding four weeks. This average became the Contract Base Price (CBP) and any time the CBP fluctuated up or down by 25% or more the contract price was adjusted.<sup>33</sup>

### **OCIP**

In another attempt to manage risk and control costs, UDOT researched and decided it was economically favorable to purchase and manage most of the insurance required for the project. Through the services of an insurance specialist, a very comprehensive insurance program was managed that even extended to workman's compensation. The Owner Controlled Insurance Program (OCIP) is "wrap-up" insurance that has been used successfully on other large projects. The comprehensive insurance covers the following:

- Statutory Worker's Compensation and Employer's Liability Insurance

- Commercial General Liability Insurance
- Umbrella/Excess Liability
- Professional Liability Insurance
- Contractor Pollution Liability
- Railroad Protective Liability Insurance
- Builder's Risk Property Insurance

It is projected that the OCIP will reduce insurance costs by \$20 million.<sup>22</sup> However, it did not totally relieve the contractor of all insurance requirements. One requirement that remained and had insurance implications was an extensive safety plan. As an added incentive for the contractor to maintain and manage a safe work site was the contract stipulation of insurance premium rebate sharing after project completion. The RFP set a target of 5.1 lost time injuries per 200,000 manhours. If the contractor finished the project under 3.1 lost time injuries per 200,000 manhours, then UDOT would split 50-50 the remaining dollars in the "loss fund." Thus it provided a mutual goal for the contractor and UDOT not to erode the loss fund which was set at \$8.3 million. If the contractor finished the project with a lost time record between 5.1 and 3.1 incidents, UDOT would rebate 5% per each .10 reduction below the target rate up to 50% for reaching 3.1 incidents or below. According to UDOT the national average for lost time incidents per 200,000 manhours is 7.0. Currently, the contractor is maintaining 1.4 incidents, with a goal of attaining 1.0 incident per 200,000 manhours.

## **FORCE MAJEURE**

Another manner in which UDOT controls and allocates risk is through force majeure event risk. The contract contains a list of specific events that allows a time extension for impacts to the critical path and those allowing a price increase. Delays from these

specific events will be classified as allowable delays and include: earthquakes, epidemics, wars, sabotage, hazardous material sites, changes in law, increases in fuel and asphalt costs, and lawsuits seeking to delay the project.<sup>7</sup>

## **GEOTECHNICAL**

The state of Utah assumed the risk that the geotechnical information is accurate.

However, UDOT is willing to share the risk associated with differential settlement during the maintenance period. The contractor is responsible for all settlement during construction and during the maintenance period to a predetermined threshold. Above this threshold UDOT would contribute to help rectify the problems.<sup>6</sup>

## **VIII. CONSTRUCTION MATERIALS AND METHODS**

The condensed construction period of four and one-half years demands that materials and construction methods and techniques be investigated. As a method of selecting appropriate materials and design Wasatch established a materials selection and approval process with a particular intent in labor and installation savings. A team would rate products and design by points.

### **DRAINAGE PIPE**

Many highway projects use the common Reinforced Concrete Pipe (RCP) for the gravity storm water system. However, the Wasatch team rated polyethylene pipe as providing a savings the I-15 project required while not sacrificing performance properties. Corrugated polyethylene pipe (PE) is a lightweight alternative to concrete pipe and thus requires less labor and equipment to install.<sup>34</sup>

With over 30 miles of PE pipe (24" and 30" diameter) the potential labor savings could be significant. The contractor estimates that PE pipe will save approximately 15% in materials and labor time compared to concrete pipe.

The PE pipe has an integral bell and spigot with a neoprene gasket on the outer rim of the spigot end of the pipe. It is easy to see why Wasatch choose PE pipe with three joints per 80 foot run versus 10 joints with RCP.<sup>34</sup> In addition, the PE pipe is much tougher and less prone to handling damage than concrete pipe. Further, the long-term performance of PE pipe has proven to be worthy for this application. Certainly something the contractor must consider because of the long-term maintenance contract associated with the project.

## GEOFOAM

Another material being used because of time saving properties as well as others is Geofoam. It is expanded or extruded polystyrene, whose characteristics include low density, enhanced insulating properties, and a strong lightweight fill. Geofoam is 40-100 times lighter than natural or compacted soil and offers the following advantages in soft soils: improves stability, reduces settlement, and allows faster construction.<sup>35</sup>

Geofoam has been used successfully in highway, railroad, bridge, and airport runway and building construction projects. Although it is more common in Europe and Japan, use in the United States is increasing as a lightweight fill material. Geofoam was used on a 21-meter high embankment for an emergency ramp at Kaneohe Interchange in Oahu, Hawaii. It was also used as lightweight fill in runway construction at New Orleans International Airport.<sup>35</sup>

It is projected some 100,000 m<sup>3</sup> of Geofoam will be used as lightweight fill material during the reconstruction.<sup>30</sup> As stated earlier, a portion of the I-15 project is located over the old Bonneville Lake, with 1000-year-old deposits of soft clays. These deposits are prime locations where the geofoam is beneficial. In fact, instead of excavating the problem areas, adding surcharge and allowing months for settlement before beginning construction the contractor will be using geofoam; because the material places no additional load in these areas and construction can begin immediately. In addition, steeper side slopes are possible because of the lighter loads.<sup>35</sup>

Typically, a geofoam embankment is constructed by placing a geotextile cover, layer of sawdust or coarse aggregate over the existing poor soils to form a level-working base. Next, the blocks of Geofoam are placed, interlocked and capped by a 10-15 cm thick reinforced concrete slab for load distribution and a protective cover. Lightweight fill or

soil is used to cover the side slopes of the geofoam. Then the road structure can be constructed over the concrete slab.<sup>35</sup>

An added benefit of using geofoam is it does not require moving utilities nor does it impose substantial loads on them. Using geofoam to eliminate the need for excavating inadequate soils and placing surcharge has the potential to save tremendous amounts of time and money.

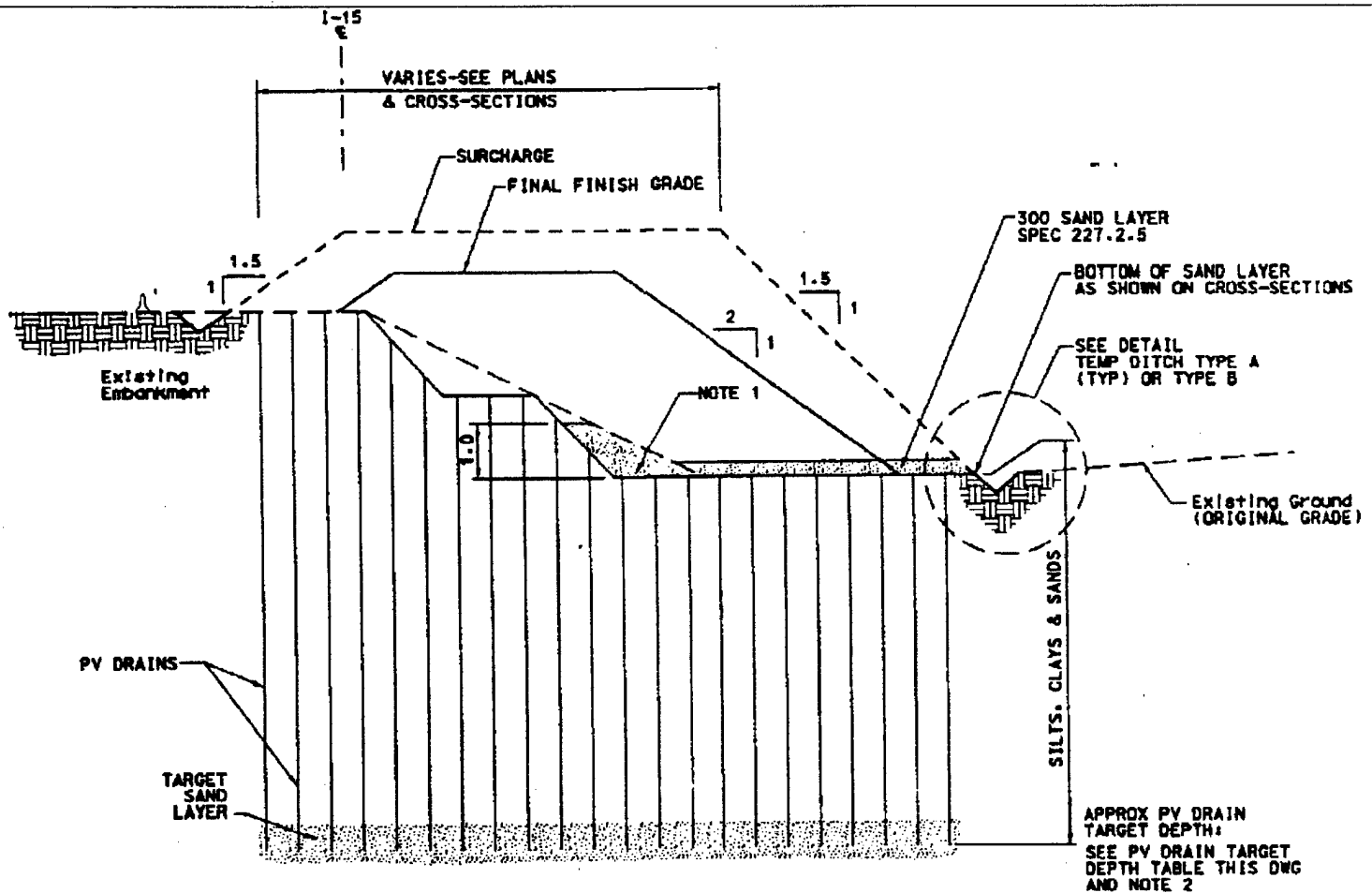
## GEOTECHNICAL CHALLENGES

UDOT performed the subsurface investigation of the project site and provided this information to the contractors. Historical information and geotechnical studies revealed soft soils beneath the corridor and projected the soils would undergo complete consolidation settlements of up to 1.5 m with potential secondary settlements of 100 mm.<sup>36</sup> The worst soils occur north of 3300 South Street. In fact, because a portion of the corridor runs through an old lakebed plus eastern Salt Lake City is rated as a seismic zone 3 (just one level below California) the geotechnical work in the downtown area is significant. The Wasatch fault, capable of producing a magnitude 7.5 earthquake, runs just east of the I-15 corridor.<sup>16</sup>

The performance specification for geotechnical work included a wide range of options including surcharging, stone columns, lightweight fills, chemical treatments, deep compaction and at-grade structures and others. The winning contractor used a number of these techniques to battle the settlement issues. Approximately, 1,500 feet of wick drains were installed in 1997 and still are drawing out groundwater. Approximately 27 million-ft of wick drains are expected to be placed on the project.<sup>3</sup> A wick drain is composed of flat corrugated plastic with fitted fabric sleeve. The ends poke out of the ground thus the name "wick" drain. Figure 10 shows a typical wick drain section. "The

drains are placed about 1.5 m apart and a sand blanket is installed on top of the drains”, says Guna Gunalan, Ph.D., P.E., geotechnical engineering manager for PB.<sup>3</sup> In the areas that have a potential for liquefaction rock piles were installed that consisted of 12 to 30 inch diameter vacuum tubes that held aggregate of 12 inch diameter. These were installed to a depth of 70 feet in three areas. Once the rock is in place the tubes are pulled up.

**FIGURE 10: TYPICAL WICK DRAIN SECTION**





The most challenging geotechnical area is near the major intersection of I-80 and State Route 201. About 3300 square yards of unstable soils required 8" lime cement columns be drilled up to 70 feet deep.<sup>3</sup> It is expected this stabilizing technique will reduce the settlement by two-thirds.

In other areas fill is being used to surcharge locations and allow as much settlement as possible. Surcharge is a common technique that uses the weight of piles of soil on top of final grades to pre-load and encourage settlement.

UDOT made the contractor responsible for all distress that may be caused to structures and properties adjacent to the corridor. With the addition of four lanes through the I-15 corridor 10-15 meters of fill is required along the 26-km stretch. The added weight has the potential to cause settlement in up to 140 structures adjacent to the roadway. To monitor and document settlement, Wasatch hired Daniel Mann Johnson and Mendenhall (DMJM) from Los Angeles to inspect structures within 15 meters of the highway.<sup>37</sup> The inspections are projected to cost \$200,000 initially not including any additional work if damaged foundations are discovered. DMJM engineers will conduct preliminary surveys and elevation measurements and document existing conditions via video and photograph. This will establish a baseline for comparison of future data. If settlement is observed Wasatch will pressure grout and jack the foundations to reinforce the buildings.<sup>37</sup>

## **SPUI'S**

Seven diamond interchanges along the corridor will be reconfigured to Single-Point Urban Interchanges (SPUI's). SPUI's are more efficient than the traditional diamond interchanges or clover leafs. They can handle higher capacities and use much less space. The most significant SPUI will be the interchange that brings together I-15, I-80, and SR-

201, also known as the "crossroads of the west."<sup>3</sup> This interchange is expected to cost \$400 million and take over four years to complete.

## IX. LESSIONS LEARNED

Overall, the project is proceeding very successfully. However, similar to any operation, performance improvement can be applied. This includes both constructive criticism for elements that were less than successful and recommendations for future use of elements that proved vital towards the project's success. Towards this end the following lessons learned are reported:

1 . Electronic RFP – While the idea of using the technology available (CD -ROM) is applaudable, the bidders would have preferred at least one hard copy of the RFP.

They felt they lost valuable time in preparing their proposals due to time spent printing, cataloging the documents, and checking to ensure all the information was there.

2. Requiring all submittals at the initial proposal – UDOT felt they should have required all submittals be submitted at the initial proposal versus waiting until the BAFO. Because the proposers did not believe they could have the price loaded schedule complete by the initial proposal UDOT allowed it to be submitted with the BAFO. However, the proposers actually did have the schedules ready but because of the terms of the RFP (and UDOT not wanting to vary from them) they did not evaluate the schedule until the BAFO. Had the proposers submitted the schedule with the initial proposal Wasatch still would have been selected and two months would have been saved in the procurement process.<sup>6</sup>

3. Dummy modification too costly - While it helped to establish competitive change order rates the amount that UDOT identified may have been large enough to affect the bid results. UDOT suspects the amount should range 2-5% of the estimated base price vice 10% shown by the bid results.<sup>6</sup>

4. The preparatory work performed by UDOT or more specifically Pre-Project Planning was vital to the success of the project. This planning included: purchasing Right-of-Ways, negotiating railroad agreements, utility and environmental permitting. Further, the geotechnical investigations provided valuable time-saving information so construction could begin without delay. Additionally, the risk analysis and assignment of risks to those that could best manage them were instrumental to the successes experienced.<sup>38</sup>
5. Award fee – While the award fee is integral to the quality assurance program, the subjective nature of typical incentive programs can be difficult to manage. After contract award UDOT revised the rating procedures by issuing an Award Fee Procedures Manual. This was an attempt to provide a more objective method for rating the contractor's performance. In the future if award fees are used UDOT would tie the award more towards milestones or quantitative deliverables.<sup>38</sup>
6. Completed plans – UDOT included several “sealed plans” in the RFP that reflected 100% design for critical features that would allow the contractor to begin the construction immediately following award. While this timesavings was envisioned to be valuable the problems experienced with changes and the responsibility and management of those changes proved difficult. In the future, UDOT would not mix completed plans with the design/build process.<sup>6</sup>
7. Best-value selection method – UDOT believes the selection of best-value procurement method over low bid has been paramount to the success experienced thus far.<sup>38</sup>

## **X. SUMMARY**

By providing broad performance specifications UDOT gave the contractors flexibility and encouraged innovation in their proposals to submit the best technical solution for demolishing and reconstructing 26 km of highway, plus replacing 140 bridges in four and one-half years. Proposals were evaluated on management and organizational quality, work plans, schedule, technical solutions and price. Further, UDOT had the forethought that allowed them to capture brilliant innovations and time saving techniques from more than one bidder. Besides partially compensating bidders for the proposal effort UDOT received the right to use the concepts proposed by the unsuccessful proposals.

Design-build contracting puts designers and constructors on the same team, pulling for the same goals, which in this case has resulted in the project being on-track toward reaching its three primary goals of Cost, Quality and most important, Time. Although several change orders have been issued the overall cost of the project has not escalated. Further, the contractor has earned 99% of the award fee available to date. This is a strong indication that the design and construction has met the quality goal established by UDOT. Finally, the contractor has consistently stayed ahead of the average trend line in the scheduled progress curve, following the early start curve with little deviation. Continued progress like this will ensure the project is completed before the much-anticipated winter Olympics in February of 2002. However, regardless of how well the project is proceeding commuters are still burdened by the construction and, therefore, will be grateful that the new expected service life will be 50 years for the concrete pavement and 75 years for the bridge structures.

## **XI. CONCLUSIONS**

Having had experience with post-award construction management of traditional contracting strategy contracts (design-bid-build, lowest responsible bidder), it is believed this project highlights the reasons why public agencies should move more toward best-value contracting. While receiving the lowest price for a project is important, many times it sacrifices quality and increases litigation between parties. It seems once contractors become aware of how much money they "left on the bid table" the battle begins between the designer, owner and constructor. Typically, the designer is concerned with protecting their reputation with the owner, and therefore will not readily admit to problems with the plans and specifications. The owner is inclined to deny all changes (even legitimate ones) because of the belief that they already paid for the work in the base bid, and of course the constructor is in business to maximize profit, and therefore capitalizes on any discrepancies in the bid documents. Thus, to avoid this common behavior design-build, best value selection is a preferred strategy because it integrates the design and construction disciplines.

Further, with the traditional method it is difficult to ensure quality constructability reviews are performed because contractors that bid on the project are forbidden from performing constructability reviews. In fact, many government constructability reviews are performed by in-house engineers and technicians that may not possess the latest "constructor knowledge" necessary to critique and recommend changes in design philosophy. Therefore, the constructability review turns into an error, omissions and coordination of the plans and specifications check, versus a true constructability review whereby methods and materials are scrutinized. On the other hand, design-build contracting strategy has constructability "built" into the process because the contractor

plans, designs, constructs, controls and in this case maintains, major elements of the project. Therefore, the opportunity for constructability is maximized.

There are a few disadvantages to using best-value contracting strategy in that it requires greater pre-award preparation, whereby the source selection plan must be developed and executed. This is much more difficult than comparing several numbers on bid-opening day and selecting the lowest bidder that has filled out the required paperwork correctly. However, the benefits of added value, higher quality, and reduced construction time greatly outweigh this initial effort. Besides the level of effort involved to develop a successful source selection plan the potential for protest is significantly greater using the best-value selection method. While objectivity of the selection criteria is key, some subjectivity inevitability will be used in determining the best contractor's proposal. Therefore, strictly following the source selection plan is vital to the success of the best-value method.

Again, the successful reconstruction of I-15 highlights the advantages of using other than low-bid contracting strategies. UDOT, by possessing the authority to accept Wasatch Constructor's proposal which was less than 3% higher than the low bid, gained far superior technical solutions and innovations that will benefit the commuters and taxpayers of Salt Lake City for at least five decades.

## XII. REFERENCES

- <sup>1</sup> Roy Nelson, "Utah's I-15 Design-Build Project," Public Roads, November/December 1997: 40-46.
- <sup>2</sup> UDOT I-15 Traffic Corridor Report.
- <sup>3</sup> Larry Flynn, "I-15's Pioneering Spirit," Roads & Bridges, February 1998: 30-40.
- <sup>4</sup> Mary Buckner Powers, "Utah Takes New Contracting Route," ENR, 27 January 1997: 10-11.
- <sup>5</sup> Dan Brown, "New Transit Projects Go Design/Build," Transportation Today, March 1998: T-5.
- <sup>6</sup> I-15 Corridor Reconstruction Project – Special Experimental Project 14 Report.
- <sup>7</sup> Nancy C. Smith, "Utah's I-15 Reconstruction Pioneers Design-Build-Maintain Contract," PW Financing, April 1997: 16-19.
- <sup>8</sup> UDOT I-15 Project Specifications, Section 4.7.
- <sup>9</sup> On-site Interview, March 17-18 1999, Salt Lake City, Utah.
- <sup>10</sup> UDOT Correspondence Memo dated 25 January 1998.
- <sup>11</sup> UDOT I-15 Project Specifications, Section 3.5.4.
- <sup>12</sup> Mary Buckner Powers, "Kiewit Team Wins I-15 Rebuild Plum," ENR, 7 April 1997: 8-9.
- <sup>13</sup> UDOT I-15 Project Specification, Section 3.5.6.4.
- <sup>14</sup> UDOT I-15 Project Specifications, Section 3.5.6.5.
- <sup>15</sup> UDOT I-15 Homepage ([www.i15.state.ut.us/](http://www.i15.state.ut.us/)).
- <sup>16</sup> Wasatch Constructors Initial Proposal, Volume I, Executive Summary.
- <sup>17</sup> UDOT I-15 Project Specification, Section 2.1.1
- <sup>18</sup> UDOT I-15 Project Specifications, Section 2.6.4.1.
- <sup>19</sup> UDOT I-15 Project Specifications, Section 15.3.5.
- <sup>20</sup> UDOT I-15 Project Specifications, Section 16.1.1.
- <sup>21</sup> UDOT I-15 Award Fee Procedures Manual.
- <sup>22</sup> UDOT I-15 Project Specifications Section 4, Appendix A.
- <sup>23</sup> UDOT I-15 Project Specification, Section 4, Appendix J.
- <sup>24</sup> UDOT I-15 Project Specification, Section 9.1.1.



- <sup>25</sup> David Banasiak, "Smart Roads Take Hold In The Salt Lake Valley," Roads & Bridges, February 1998: 42-44.
- <sup>26</sup> UDOT I-15 Project Specification, Section 3.3.16.
- <sup>27</sup> UDOT I-15 Project Specification, Section 17.2.2.1.1.
- <sup>28</sup> UDOT I-15 Project Specification, Section 17.1.
- <sup>29</sup> UDOT I-15 Project Specification, Section 2.1.6.1.
- <sup>30</sup> Aileen Cho, "High Hopes Highway," ENR, 2 November 1998: 30-36.
- <sup>31</sup> "I-15: Project Management In A Design-Build Environment," Roads & Bridges, February 1998: 46-54.
- <sup>32</sup> UDOT I-15 Project Specifications, Section 21.1.
- <sup>33</sup> UDOT I-15 Project Specifications, Section 4, Appendix D 109.3.
- <sup>34</sup> "Largest Design-Build Freeway Project Counts on PE Drainage Pipe", Roads & Bridges, September 1998: 28-31.
- <sup>35</sup> Dawit Neguessey, "Putting Polystyrene To Work," Civil Engineering, March 1998: 65-67.
- <sup>36</sup> UDOT I-15 Project Specification, Section 6.3.4.1.
- <sup>37</sup> "Structures Near I-15 Project Monitored for Settlement," Civil Engineering, June 1998: 18.
- <sup>38</sup> Texas Research Board (TRB) 78<sup>th</sup> Annual Meeting, January 10-14, 1999, Washington, D.C.

### **XIII. APPENDICIES**

- A – Proposed Questions to UDOT**
- B - UDOT I-15 Reconstruction Organization Chart**
- C - RFP Outline**
- D - I-15 Technical Evaluation Criteria**
- E - Option Packages**
- F - Interstate Junction Renderings**
- G - Wasatch Constructors Proposed Organization Chart**
- H - Award Fee Organization**
- I - Award Fee Summary Report**
- J - Award Fee Criteria and Sub-Element Guidelines**
- K - Award Fee Process Flow Chart**
- L - Public Information Handout**

## **APPENDIX A**

### **Requested documents**

Can I get some progress photos? *Rebecca Crawford to send some.*

Can I get a copy of a typical progress report as specified in 2.2.6.1.3? Any other project statistics? *See SEP report, Monthly report.*

Can I get a copy of the organization chart for both contractor and owner? *(Initially designed, changed, effectiveness, interaction with owner/contractor) Need to ask Guna for contractor's, got UDOT.*

Can I get a copy of the risk matrix developed by UDOT? *Got it.*

Do you have some good renderings of the Mainline cross sections... before and after? *See what is in the RFP.*

Can I get a map of the "most challenging geotechnical area" – near I-80/State Route 201? *RFP*

Do you have a cross section of a wick drain that is typically being installed in the project? *No. Got an understanding of what they are and also a drawing that illustrates use.*

Is a Gantt chart available for key milestone dates for the project? Also, the Contractor's schedule?

*Didn't get to talk with the contractor. No milestone chart available. Did get the contractor's original submitted schedule on PPP.*

What types of plot plans are available that I can use to illustrate the project? *Got one. Also pull off Internet.*

### **General Contract**

What was your basis for assuming \$200 million in federal funding? *\$450M in centennial funding, projected \$200m for I-15.*

What impact did FHWA have on the decision to go design-build? *Not on the decision but helped in the submittal and approval process. MOU between Governor and FHWA head.*

Is the SEP-14 still being used as design-build? Is design-build still considered "new"? *No.*

What does State laws say regarding contracting? Must be low bid? *Yes. Had to enable legislation to allow process.*

Is there State requirements for DBE dollar amounts or just Federal? *Federal only.*

Why FHWA waive 30% requirement to be performed by Prime Contractor? *Too difficult to track.*

How many contractors requested packages to bid upon? How many actually bid on the project? Was there anything else that fell out of the initial RFP? – (Maintenance was initially wanted for 20 years). *See SEP report. Only four attended the information meeting with UDOT, then there were three – Wasatch, Lake Bonneville Contractors, Salt Lake Constructors. Nothing else fell out. Input from Contractor included.*

Can you explain the process of identifying the scope of work for the project? How it developed? Was it revised do to budget constraints, etc? *See timeline and discuss about Wasatch Front Council. Light rail and I-15 initially studied together then they split.*

Were any proposals received with Susceptible or Unacceptable in technology category? *No unacceptable, may have been a few susceptible in the initial submittal but could not remember.*

Who were the observers for final selection? What function did they perform? What could they prove? *They were members of the UDOT transportation commission. Also, some state legislature members were invited but did not attend. They were there when the decision was made – actually a part of the final decision – it was unanimous.*

How many options were picked? *All*

What was the major steps in the procurement process? RFQ, RFP, BAFO.. (any others)? *LOI also – see SEP report.*

Were the evaluation factors for the technical and prices equal in weight? *They were approximately equal in weight – that is all they would say.*

How long were the oral presentations?  
*½ per team*

I have conflicting total costs of Wasatch's bid. What is the total price 1.325 or 1.5M?

*\$1.318 billion in base bid + \$7 million in options. \$1.59 is the total cost of I-15. See SEP report for more info.*

Was it truly a best value or was Wasatch's bid also low? *Yes, Wasatch was slightly higher than low.*

How much time and money was spent in Pre-Project-Planning? (Preparing Phase I design, Preparing the contract, writing the specs, Decision process to go ahead with the project)  
*Since 1996 – see timeline, approximately 30 people, \$7-8 million – guess.*

*What typically did you use design specs for and what performance? Called it performance specs which were a combination of end results specs, design parameters, and prescriptive specs. Box – see SEP report.*

What was the nature of the Railroad work?  
*3 locations grade separation, track work, etc.. see RFP.*

What all is included in the weigh-in –motion facilities? *Seems to be a check of over loads into the city... not a real clear answer on this.*

What was the meaning of breaking the utility work into four sections? A, B, ATMS, Outfalls  
*It was because so added work was inserted at the end.*

Do you have an Information Technology plan for the project? (i.e. you dictated Primavera Expedition) *Other software programs, intergraph, inroads, etc. see RFP. Also, PC DOCS.*

How was the quality of the QC, QA plan handled? Has the ISO standards been meet?

*Yes, ISO standards have been met. Review approval of QC plan UDOT's forte – no problems*

Concerning the public surveys, how many were sampled? What type of surveys and questions were asked? How was the data analyzed?

*How is the public relations program going? Program going well. Surveys are still being completed. Need to speak with Lindsey Wilkerson if want additional information.*

How did the freezing temperatures affect your planning? What amount of work can be done in the winter? *Actually the winters have been pretty mild. Mostly, concrete structures work.*

What all is force majeure event risk? *Acts of God.*

I have conflicting data on liquidated damages. Please clarify. *Varies. See RFP.*

How much and how long was the performance security (bond) for the maintenance term? *They have not picked up the initial maintenance period yet...probably will. Nothing different from RFP.*

What all is in the maintenance term? *It is really an extended warranty on structures, etc. See RFP.*

What are your lessons learned thus far? Is there anything significant you would do differently? *Nothing to add. Look in SEP.*

### **Geotechnical**

Has there been any structural damage caused to adjacent properties? How was 15 meters decided upon to monitor? *DMJM monitoring. Actually the monitoring distance is based on ½ height of the embankment. Yes, there has been damaged. One location they used underpinning to 70' but the home still fell apart..the people had to be moved.*

Have there been any changes based on the geotechnical site investigations that were provided to the contractor?

What is meant by saying UDOT will assume the risk that the geotechnical information is correct? Have you had to pay additional money for changes due to inaccurate information?

How do you plan to share the cost of settlement with the contractor? How is it determined? Monitored?

*There has been some modifications ..the contractor and UDOT signed a memo of understanding concerning sharing of costs. See memo.*

### **Award Fee**

What happens if there is a dispute between the contractor and UDOT concerning the award fees? Has there been any? How much has been paid to date in award fees?

*The selection official (Mr. Warne) has the final say. Although, they try to resolve disputes at the lowest level – using the partnering spirit. Yes, there has been disagreements.*

*12,490/12,500.*

What is the contractor's self assessment regarding performance? What all is included?

How long does the contractor have to respond to the PEC report?

Do you have a timescale of this whole process?

*The procedures changed from the RFP. See new guidelines.*

Can you explain the calculation for award fee? One place it says 80pts or greater but the table shows different numbers.

*See example (multiple pages)*

### **Funding/Payments**

Why is there a cap on the payment schedule? *For fiscal planning... but it was provided by the bidders..not dictated by UDOT.*

Concerning funding of the project, can you explain where the money is coming from? How much are vehicle registration prices going to increase? As discussed in paper. *\$10/vehicle. Centennial highway fund.*

Was the maximum payment schedule based on Wasatch's proposal or established for all?

What is the current funding plan? *See above.*

### **ATMS**

How is the ATMS going? What features are being used during construction period?

*Good. Variable message signs, videos, etc.*

What is the cost of the ATMS system? Will any be operational after I-15 or part of larger project? *\$100 Million valley wide, \$70 Million I-15. If need additional info contact PB*

*Ferradine*

### **Right-Of-Way**

Do you have a breakdown of parcels of land acquired (ROR) ..Residential, commercial, demo, relocation?

Contact Craig Frisbee.

Who did the demo? Relocation? What if people did not want to move?

### **OCIP**

How is OCIP program going? What insurance was the contractor required to have?

How is job safety? How many accidents? How will the death affect the sharing of rebates?

Can you describe the OCIP program?

How was the decision made to go OCIP? *Economically driven, some contractors get good deals and therefore gain a bid advantage or pad proposal.*

How is money saved by using OCIP? *Project \$20 million to be saved. Sharing goal is not to erode the loss fund (General liability pool). What is left over is split 50-50 with the contractor. Also, some type of safety award at the end of the contract.*

## Research

How is the full-scale research going? What universities were involved? What results thus far?

Any other articles on research?

What were they testing for... Foundation –

Pushover - (could not read the specs as it cut off the wording) ?

What are the research objectives for the three universities? Do you have any more detail in this area?

*Need to contact someone at main UDOT offices for answers.*

## Contractor Questions

Can we discuss your planning for the interface between traffic control and construction staging/sequence? What were the problems? How did you approach the project from a constructability perspective? etc.

*Two groups were assigned to the MOT task force. One construction strategy and handling traffic on the corridor and one investigating regional impacts and opportunities, off-corridor impact. They developed the idea of the 4<sup>th</sup> lane on I-215. The first group led them to the plan for maintaining 3 lanes south of 215. Trying to keep traffic on the freeways. They used MINUTP to get a LOS better than the RFP allowed. They wanted to add value to the process.*

How much time did you spend on constructability reviews?

*There were 250 construction packages (bridges, retaining walls, foundation treatment, etc) per the design quality management plan for each discipline 30%, 65%, 90% reviews will all players.*

How big of an issue was laydown and staging areas?

*No real problems encountered. By closing down ½ side of the freeway we had full access and plenty of room, also the material supply was fairly close by.*

What was most challenging in putting together your proposal?

*The biggest effort was understanding the scope of work. Foundation treatments required, the additional engineering studies required, only boring logs were provided by UDOT. Studies were required to determine the settlement and engineering the settlement. Determine how could add value. Reconfigure for money savings.*

What are your lessons learned thus far?

*Hard copy of the RFP. Need for flexibility in changing the plans and specs. The I-15 corridor specs supported the performance specs but it could be reasonable to change the plans and specs if the need raised. (maybe some resistant to entertain change specs).*

What type of materials management program is the contractor using?

*No elaborate program. Forecast through project planning. Material sources are close by.*

Any unique materials being used?

*Scoria. Naturally occurring lava material used in lessening loads – lightweight fills.*



How is the geofoam working out?

*Great. 100,000 m<sup>3</sup> will be used. Double layer of protection load distributed by slab concrete 13" of concrete.*

Do you have the dollar amount saved in LF of pipe by using PE pipe vs. RCP?

*No.*

Can I get a copy of the organization chart for the contractor? Also, what was your approach in creating the organization chart?

*Experience in similar to work in California (toll road) with a central hub and 3 segments. Each segment essentially works as own. Easier to manage.*

What type of computer modeling was used on the project? By the contractor and UDOT. Can you at least ask Granite Construction what computer modeling tool they used to establish their proposal? What did they optimize – productivity or cost/unit?

*Not aware of any. I can contact Gary Higdeme (408-722-2716) with Granite to find out.*

How is job safety? How many accidents? What have you done differently since the worker death?

*Pick-up truck backed over a worker. Shut down the job and had a mass safety meeting - discussed specifics of problem and others. Instituted policy for back-up alarms on pick-ups and autos.*

What percent complete are you now? How much of the incentive fee have you earned?

*All designs are complete. Projecting to finish 3 months early. About 60% complete.*

*Segment 1 is 40%, plan on finishing 1 year early. Segment 2 – 50-60 bridges...*

*Plan to earn all the award fee. The amount not earned is recoverable because related to schedule.*

What type of changes have been done?

*Changes due to value engineering, final design reconfiguration, identified a traffic operations problem rectified, enhancements hat local cities wants – 36" vice 24" pipe (utility betterments, aesthetic enhancements).*

*Conversation with Gary Higdeme with Granite – Use Caterpillar simulation software, program for optimizing for haulers – if interested in more detail see Fairfield Utility job (18 mile railroad).*

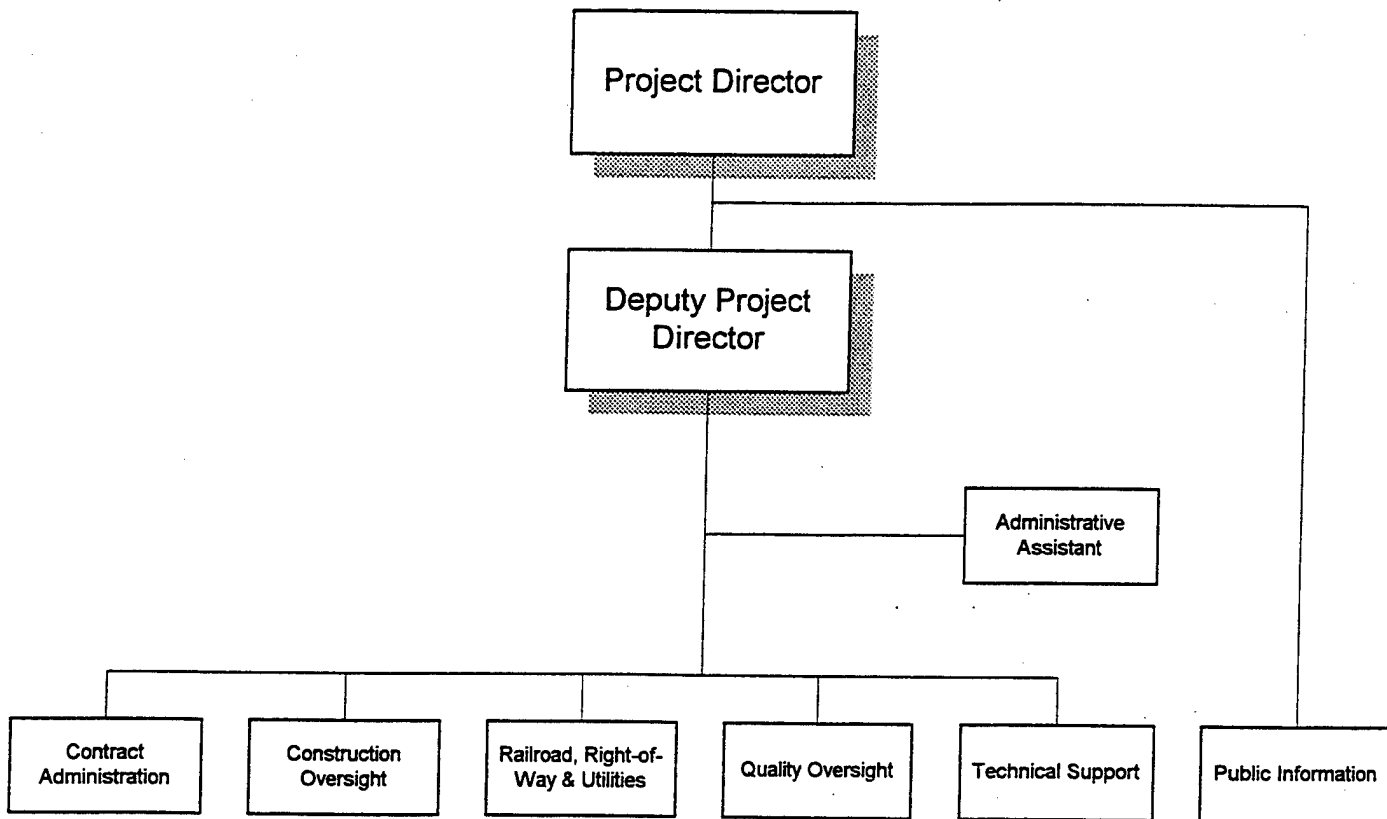
*Gary is the Vice President of Heavy Civil Division. In 1997 Granite was the top highway builder.*

*Usually when contacts are in the \$300-\$500 Million range they team up with Kiewit.*

## **APPENDIX B**

# ***I-15 Reconstruction Project Organization***

*Utah Department of Transportation  
I-15 Reconstruction Project*



Approved:

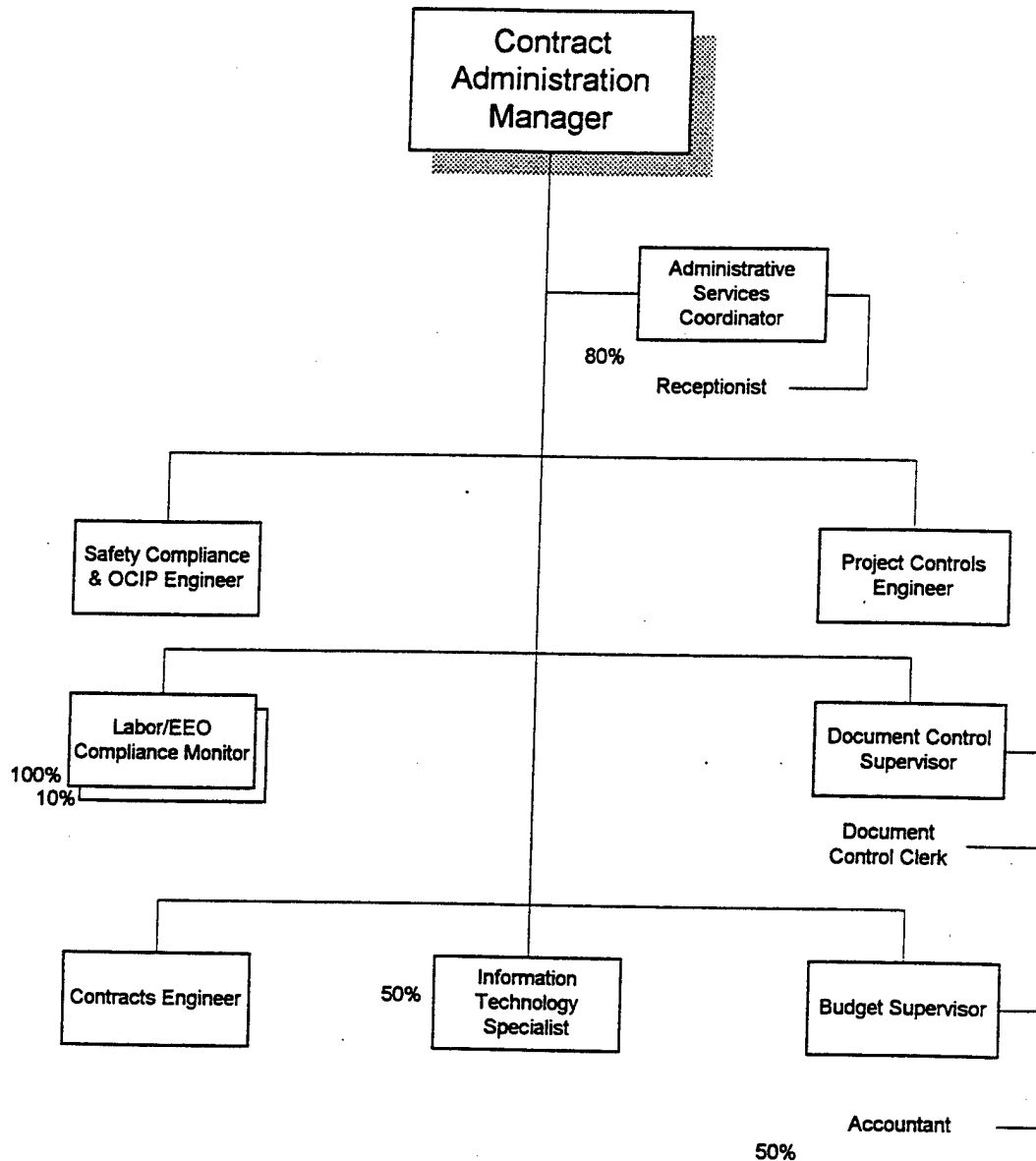
David Downs  
Project Director

Date:

6/3/98

# Contract Administration

Utah Department of Transportation  
I-15 Reconstruction Project

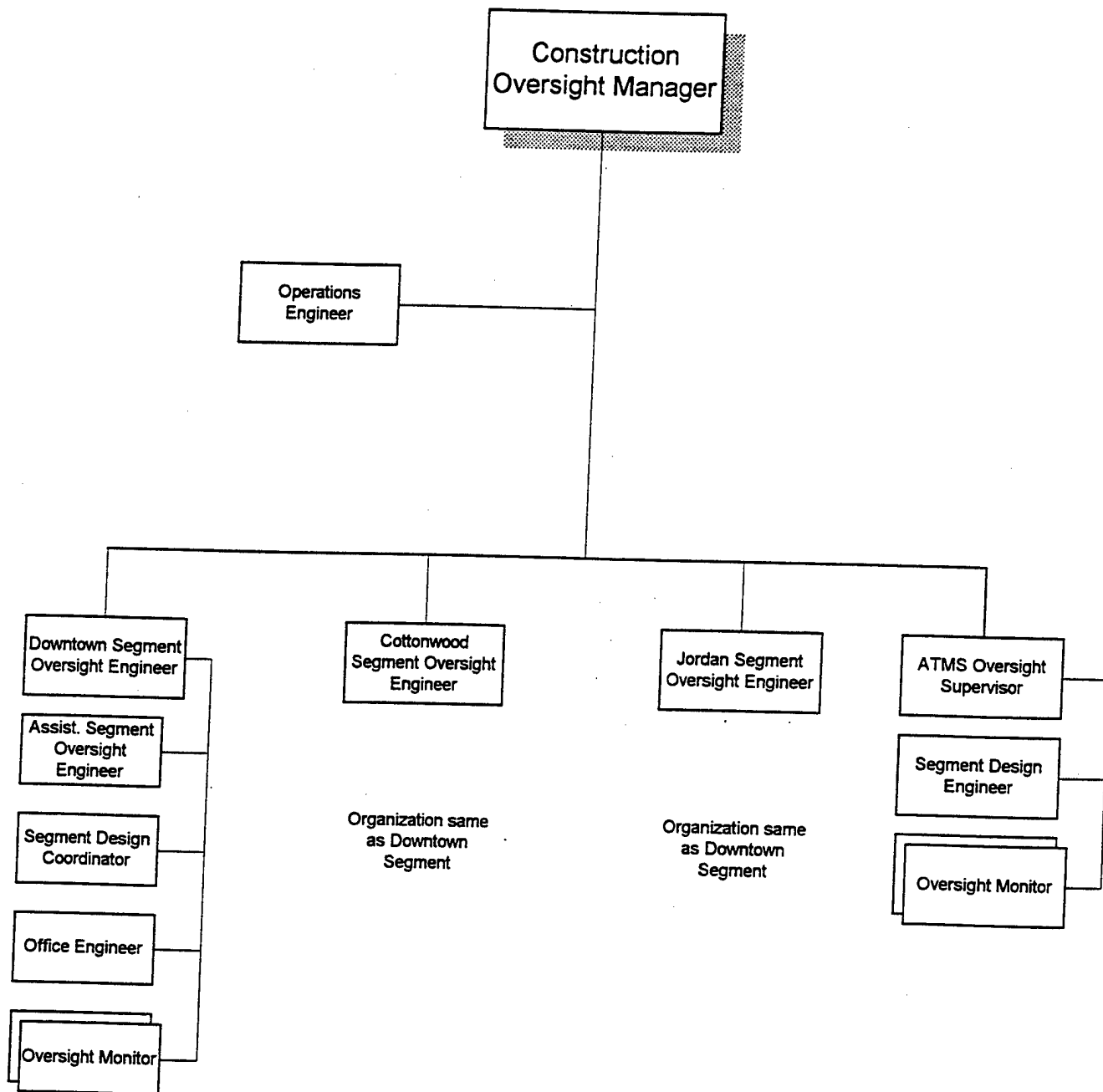


Approved: David Downs  
David Downs  
Project Director

Date: 6/24/98

# Construction Oversight

Utah Department of Transportation  
I-15 Reconstruction Project



Approved:

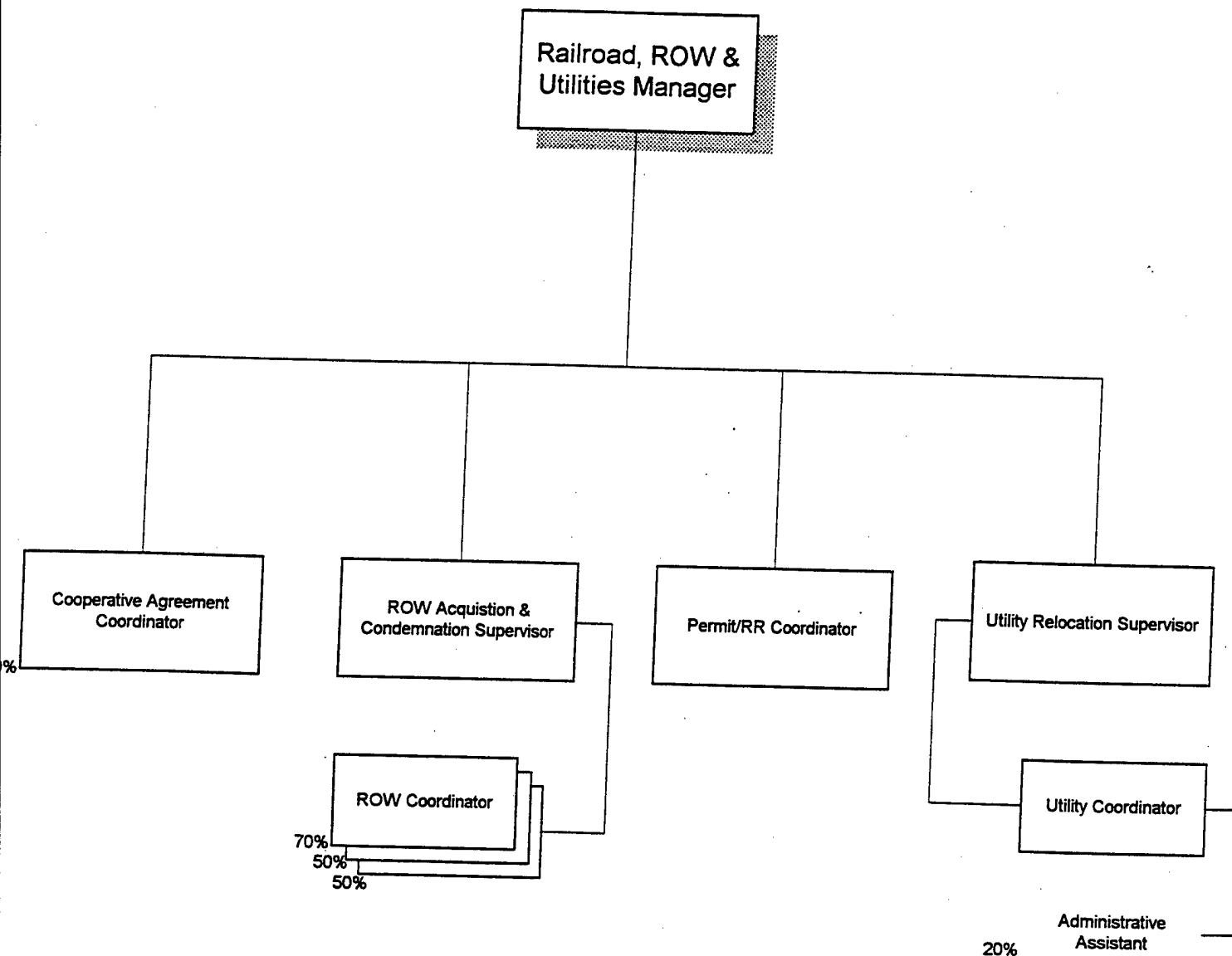
David Downs  
Project Director

Date:

6/27/98

# Railroad, Right-of-Way & Utilities

Utah Department of Transportation  
I-15 Reconstruction Project



Approved:

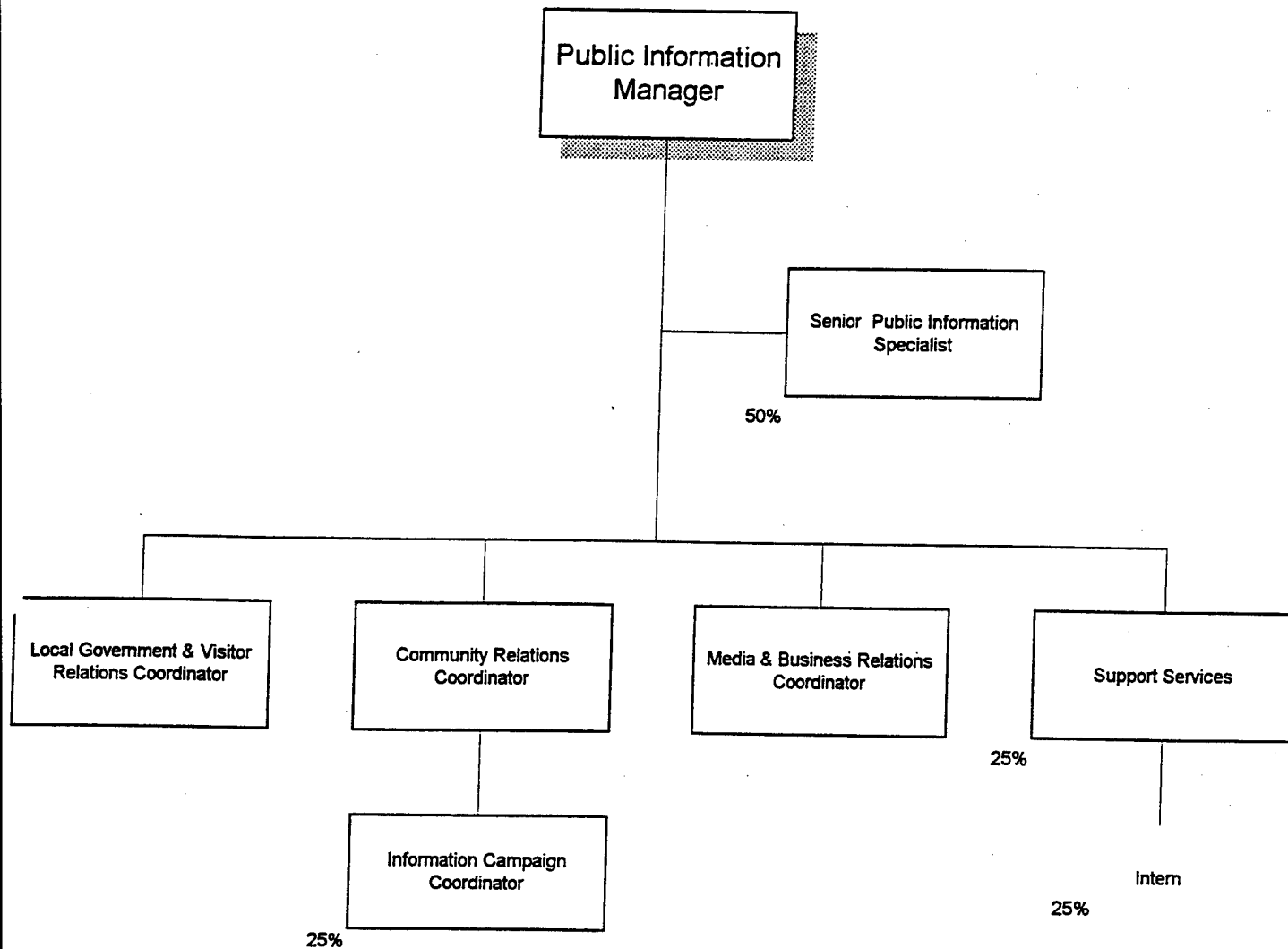
*David Downs*

David Downs  
Project Director

Date:

*6/24/98*

# Public Information



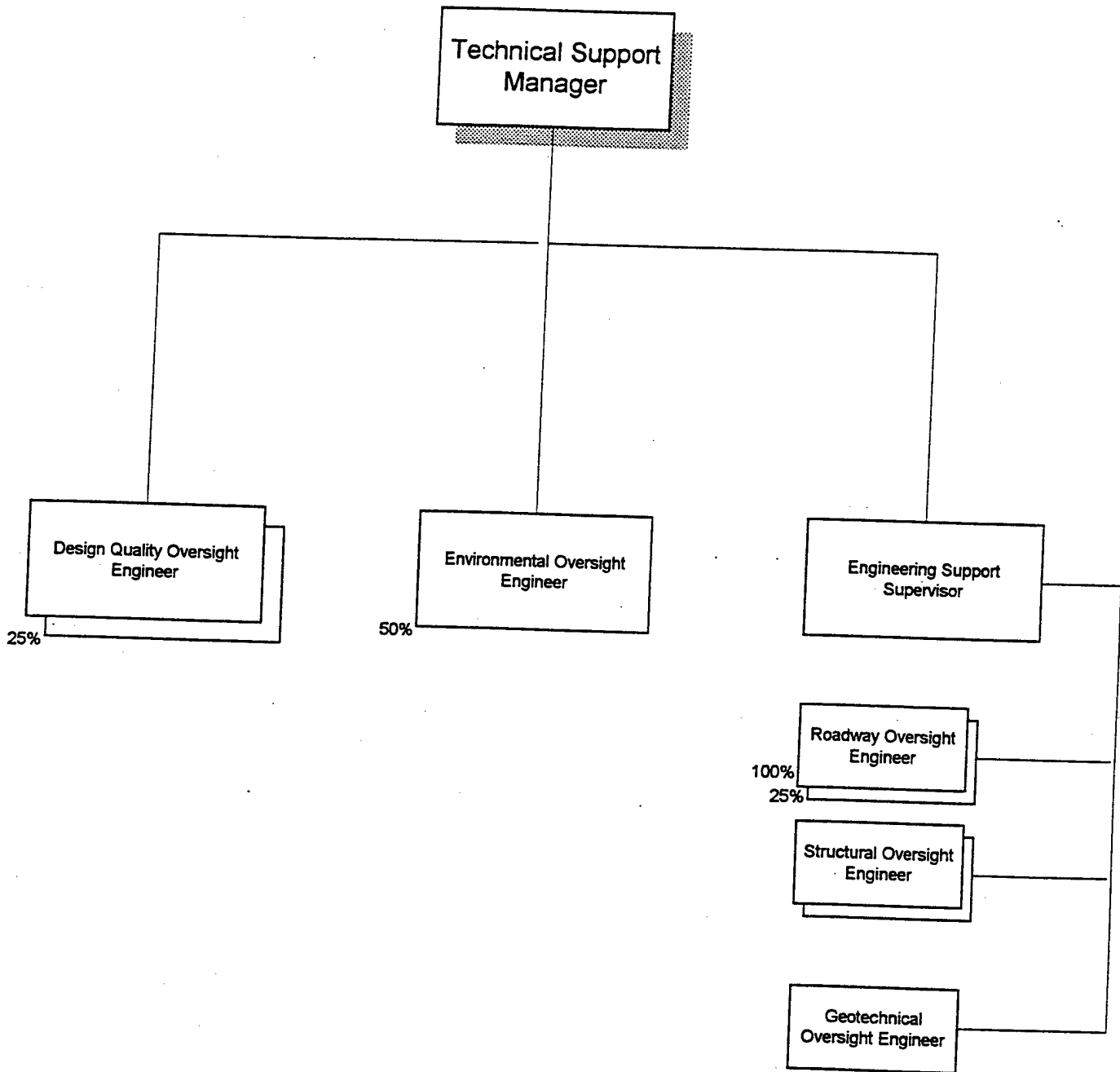
Approved: \_\_\_\_\_

David Downs  
Project Director

Date: \_\_\_\_\_

6/29/98

# Technical Support



Approved:

*David Downs*

David Downs  
Project Director

Date:

06/24/98



## **APPENDIX C**

**Document Designation Key:****M =Mandatory Requirements****R = Reference Documents****S = Sealed Documents****B = Basic Configuration**

<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
<b>1.0</b>	<b>General Instructions &amp; File Index</b>	<b>R</b>
<b>1.1</b>	Organization of the Request For Proposals	<b>R</b>
<b>1.2</b>	Relationship of Documents	<b>R</b>
<b>1.3</b>	Electronic File Index and Designation of Documents	<b>R</b>
<b>2.0</b>	<b>Scope of Work</b>	
<b>2.1</b>	Technical	<b>M</b>
	2.1.3 Attachment 1    Option J	
<b>2.2</b>	Project Management	<b>M</b>
<b>2.3</b>	Schedule	<b>M</b>
<b>2.4</b>	Department Role	<b>M</b>
<b>2.5</b>	Railroad	<b>M</b>
	2.5.3 Attachment 1    600 West Crossing of Andy Avenue Railroad Spur	
<b>2.6</b>	Utilities	<b>M</b>
	2.6 Attachment 1    Estimated Length of Review Period of Utility Plans by Utility Owners	
	2.6 Attachment 2    Design and Construction of Utility Work	
	2.6 Attachment 3    Water District Boundaries	
	2.6 Attachment 4    Sewer District Boundaries	
	2.6 Attachment 5    New Facilities and Betterments	
	2.6 Attachment 6    Design and Construction of Utility Work	
	2.6 Attachment 7    Potential 'Early Action' Utility Flow Chart	
	2.6 Attachment 8    Utility Flow Chart	
	2.6 Attachment 9    US West Prequalified Contractor List	
	2.6 Attachment 10    US Sprint Prequalified Contractor List	
	2.6 Attachment 11    Cottonwood Improvement District Prequalified	

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I-15 Corridor Reconstruction Project**2**General Instructions**RFP Section 1.0**Oct 1, 1996 - Feb. 28, 1997*

<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
	Contractor List	
2.6 Attachment 12	List of Prequalified Contractors for MCI and Qwest	
2.6 Attachment 13	Construction Concerns of Utility Owners	
2.6 Attachment 14	Amoco Oil Company List of Contractor Qualifications	
2.6 Attachment 15	Sample Utility Information Packet	
Appendix A	08-1 Design Activities	M
Appendix B	Project Elements	M
Appendix C	Invoice Data Sheet	M
<b>3.0</b>	<b>Instructions to Proposers</b>	
3.1	Introduction	M
3.2	General Information	M
3.3	Procurement Process	M
3.4	Proposal Requirements	M
3.5	Evaluation Process	M
Appendix A	Forms	M
	Form A Proposal Letter (BAFO)	M
	Form A-1 Proposal Letter (Initial Proposal)	M
	Form B Information About the Proposer (Initial Proposal/BAFO)	M
	Form C Responsible Proposer Questionnaire (Initial Proposal)	M
	Form D Proposer's Declaration Regarding Subcontractors and Suppliers (Initial Proposal)	M
	Form E Proposer's Status as DBE (Initial Proposal)	M
	Form F <i>Not Used</i>	
	Form G <i>Not Used</i>	
	Form H Proposer's DBE Information and Good Faith Efforts (Initial Proposal)	M
	Form I Non-Collusion Affidavit (Initial Proposal)	M
	Form J Labor Schedule (BAFO)	M
	Form K Price Proposal (Initial Proposal/BAFO)	M
	Form K-1 Proposer's Price Distribution for Each Month (BAFO)	M
	Form K-2 Maximum Payment Schedule (BAFO)	M
	Form K-3 Minimum Performance Schedule (BAFO)	M
	Form K-4 Construction Price Elements (Initial Proposal/BAFO)	M
	Form K-5 Maintenance Pricing Forms (Initial Proposal/BAFO)	M

*Addenda (1-8)*

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
Form K-6	Proposer's Activity Listing and Price Proposal Format (Initial Proposal/BAFO)	M
Form K-7	Information Regarding Design and QC/QA Price Proposal	M
Form L-1	Proposal Bond (BAFO)	M
Form L-2	Performance Bond (BAFO)	M
Form L-3	Payment Bond (BAFO)	M
Form M	Escrow Agreement (BAFO)	M
Form N	Price Proposal Cover (Initial Proposal/BAFO)	M
Form O	Technical Concepts Cover Sheet (Concept Review Cover)	M
Form P	Buy America (BAFO)	M
Form Q	Contractor's Preferred ROW Acquisition Priority & Schedule	M
Form R	Proposer's Guarantee (Initial Proposal)	M
Form S	Bridge and Pavement Destruction Testing Program (Initial Proposal)	M
Appendix B	Organization of Proposal	M
4.0	<b>Contract Provisions</b>	
4.1	Contract Components; Interpretation of Contract Documents	M
4.2	Obligations of Contractor; Effect of Reviews; Inspections and Tests	M
4.3	Information Supplied to Contractor; Acknowledgment by Contractor; Representations and Warranties	M
4.4	Time Within Which the Project Shall be Completed; Scheduling and Progress	M
4.5	Quality Control/Quality Assurance; Design and Construction Documents; Safety Program; Subcontracts; Key Personnel	M
4.6	Acquisition of Real Property; Commencement of Construction; Construction Procedures; Relocations, Environmental Mitigation	M
4.7	Disadvantaged Business Enterprises; Equal Employment Opportunity	M
4.8	Performance and Payment Security	M
4.9	Insurance	M
4.10	Responsibility for Loss or Damage; Title	M
4.11	Warranties	M
4.12	Payment For D/B Work	M
4.13	Changes in the D/B Work	M
4.14	Maintenance Work	M
4.15	Termination for Convenience	M

*Addenda (1-8)*

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
4.16	Default	M
4.17	Damages	M
4.18	Indemnification	M
4.19	Dispute Resolution	M
4.20	Acceptance	M
4.21	Documents and Records	M
4.22	Value Engineering	M
4.23	Cooperation and Coordination with Other Contractors, Member Agencies and Developers	M
4.24	Miscellaneous Provisions	M
Appendix A	Award Fee Evaluation	M
Appendix B	Partnering	M
Appendix C-1	Required Contract Provisions: Federal-Aid Construction Contracts	M
Appendix C-2	Prevailing Wage Rates	M
Appendix C-3	E.E.O. Affirmative Action Requirements on Federal and Federal Aid Construction Projects	M
Appendix D	General Provisions	M
Appendix E	Definitions	M
Appendix F	Special Provisions: Disadvantaged Business Enterprises	M
Appendix G	Payment Schedule	M
Appendix H	<i>Not Used</i>	
Appendix I	Maintenance Bond	M
Appendix J	Liquidated Damages Schedule	M
Appendix K	Form of DRB Agreement	M
<b>5.0</b>	<b>Corridor MOT &amp; Facility Maintenance</b>	
5.1	Maintenance of Traffic Performance Specification	M
5.2	Maintenance During Construction	M
5.3	Maintenance After Construction	M
Appendix A	Maintenance Performance Specifications (During Construction)	M
Appendix B	Maintenance Performance Specifications (After Construction)	M
Appendix C	Bridge Inspection Reports dated 11/26/96 and 12/04/96	
<b>6.0</b>	<b>Performance Specifications</b>	
6.1	Drainage	M
6.2	Roadway Geometrics	M
6.3	Geotechnical	M

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<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
6.4	Water Quality	M
6.5	Lighting	M
6.6	Pavements	M
6.7	Signing	M
6.8	Traffic Signals	M
6.9	Structures	M
6.10	Concrete Barriers	M
6.11	Landscape and Aesthetics	M
6.12	Permanent Weigh-in-Motion (WIM) Sites	M
6.13	Fiber Optic Utility Conduit	M
<b>7.0</b>	<b>Standard Drawings and Specifications</b>	
7.1	I-15 Corridor Specifications	M
	Table of Contents	
	Division 200: Earthwork	
	Division 300: Base Courses	
	Division 400: Surface Courses	
	Division 500: Structures	
	Division 501: Attachment A Pile and Driving Equipment Data	
	Division 508: Attachment A Bar Supports	
	Division 600: Incidental Construction	
	Division 700: Materials	
	Division 800: Traffic Control and Safety	
	Division 900: Drainage Features	
7.2	Standard Drawings	R
7.2.1	Standard Drawings	R
7.2.2	Structural Standard Drawings	R
7.2.3	Drainage Structural Drawings	R
7.3	List of UDOT Publications	R
7.4	UDOT Standard Traffic Control Plans (Sheet 4's)	M
7.5	UDOT Qualified Products List	M
<b>8.0</b>	<b>Guidelines &amp; Mandatory Programs</b>	
8.1	I-15 Corridor Design Supplement	M
Appendix A	IDF Curves	
Appendix B	Example Drawings	
Appendix C	Situation and Layout Sheet Requirement Checklist	
8.2	Quality Management Program	M

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
Appendix A	Tabulation of Sampling and Testing	
Appendix B	Materials Spread Sheets	
8.3	Safety Program	M
8.4	Insurance	M
8.5	I-15 Landscape and Urban Design Guidelines	M
8.6	Signing Plan	M
8.7	I-15 Corridor Pipe Selection Guidelines	M
8.8	<i>Not Used</i>	
8.9	I-15 Corridor Subsurface Exploration and Laboratory Testing Guidelines	M
8.10	Geotechnical Report Guidelines	M
8.11	Geotechnical Design Guidance Manual	M
8.12	I-15 Corridor Seismic Hazard Analysis	M
8.13	UDOT NPDES Guidelines for Compliance with the General Permit for Construction Activities	M
8.14	I-15 Corridor Soil Classification Field Manual	M
8.15	<i>Not Used</i>	
8.16	<i>Not Used</i>	
8.17	Noise Abatement: UDOT 08A2-1	M
8.18	Phase II Investigation Report of Potential Acquisition Parcels Impacted by Hazardous and Harmful Materials	M
9.0	ATMS Performance Specification	M
9.1	ATMS	M
	9.1 Attachment 1 Salt Lake Area I-15 ATMS Equipment Vendor List (EVL)	
<b>10.0</b>	<b>Design Data</b>	
<b>10.1</b>	<b>Geotechnical Reports</b>	<b>M</b>
10.1.1	<i>Not Used</i>	
10.1.2	<i>Not Used</i>	
10.1.3	<i>Not Used</i>	
10.1.4	9000 South Section	
10.1.5	7200 South Section	
10.1.6	Railroad Grade Separation at 10600/9000 and 9150 South	
10.1.6	Report of Subsurface Soils Exploration (Structures) and Addendum	

<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
10.1.6.1	10.1.6 Attachment 1 Retaining Wall on 10600 South 9000 South Railroad Grade Separation Retaining Wall on Soldier Pile/Drilled Caisson	
10.1.7	5300 South Section	
10.1.8	4500 South Section	
10.1.9	3300 South Section	
10.1.10	Overpasses	
10.1.10.1	2700 South Overpass	
10.1.10.2	3900 South Overpass	
10.1.10.3	Vine Street Overpass	
10.1.11	2400 South Section	
10.1.12	State Street Section	
10.1.13	900 West Section	
10.1.14	1300 South Section	
10.1.15	600 South Section	
10.1.16	600 North Section	
10.1.16.1	600 North/I-15 Interchange Improvements	
10.1.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
10.1.17	Team Track	
10.1.18	<i>Not Used</i>	
10.1.19	9000 South Frontage Road Connections (See RFP Section 10.1.6)	
<b>10.2</b>	<b>Utility Information Sheets</b>	<b>M</b>
	10.2 Attachments (1-80)	
	10.2 Attachment 80 Utility Information Sheet Revisions	
	10.2 Attachment 81 New Utility Information Sheet	
	10.2 Attachment 82 Utility Information (US West)	
	10.2 Attachments (83 - 91) Utah Power and Light	
	10.2 Attachment 92 Salt Lake City Suburban Sanitary District No.1	
	10.2 Attachment 93 US West Communications	
	10.2 Attachment 94 US West Communications for 600 North/I-15 Interchange Improvements	
	10.2 Attachment 95 US West Communications for 600 North Railroad and Viaduct and Southbound Ramp over I-15	

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
10.2 Attachment 96	Utility Information Sheet Revisions (Addendum 4)	
10.2 Attachment 97	9000 South Frontage Road Utilities and Proposed Solutions	
10.2 Attachment 98	10600, 9150 and 9000 South Utilities and Proposed Solutions	
10.2 Attachment 99	US Department of Transportation Regulations Pertaining to 6-inch D&RF diesel line.	
10.2 Attachment 100	Salt Lake City Suburban Sanitary Sewer District No. 2 Letter of Summary and Comments	
10.2 Attachment 101	US West Communications Letter	
10.2 Attachment 102	Memo Identifying Potential Conflicts Pertaining to the 6-inch D&RG Diesel Line	
10.2 Attachment 103	9000 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 104	7200 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 105	4500 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 106	3300 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 107	2400 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 108	State Street Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 109	900 West Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 110	1300 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 111	600 South Utility Potholing Information Related to Phase One Design Plans	
10.2 Attachment 112	Salt Lake County Sewer Improvement District No. 1 Letter of Memorandum	
10.2 Attachment 113	Mountain Fuel Supply Company Design Specification Requirements	

<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
10.2 Attachment 114	9000 South Frontage Road Mountain Fuel Supply Company Conflicts and Cost Estimates	
10.2 Attachment 115	Railroad Grade Separation at 10600, 9150 and 9000 South Mountain Fuel Supply Company Conflicts and Cost Estimates	
10.2 Attachment 116	Railroad Grade Separation Projects	
10.2 Attachment 117	Salt Lake County Sewer Improvement District No. 1 Design Plan	
10.2 Attachment 118	Revisions of UIS #008-13-029	
10.2.2	Utility Conflict List at 600 North	
<b>10.3</b>	<b>Railroad Information Sheets</b>	<b>M</b>
10.3.1	Points of Concern	
10.3.2	Southern Pacific Lines Railroad Data Sheets	
10.3.3	Union Pacific Railroad Data Sheets	
10.3.4	Utah Transit Authority Railroad Data Sheets	
10.3.5	Aerial Crossing Easement	
<b>10.4</b>	<b>Calculations</b>	<b>R</b>
10.4.1	<i>Not Used</i>	
10.4.2	<i>Not Used</i>	
10.4.3	<i>Not Used</i>	
10.4.4	9000 South Section	
10.4.5	7200 South Section	
10.4.6	Railroad Grade Separations at 10600, 9150 and 9000 South	
10.4.6.1	Railroad Grade Separations at 10600 South	
10.4.6.2	Railroad Grade Separations at 9150 South	
10.4.6.3	Railroad Grade Separations at 9000 South	
10.4.6.4	Precast Concrete Crib Wall - Cribblock Design Calculations	
10.4.7	5300 South Section	
10.4.8	4500 South Section	
10.4.9	3300 South Section	
10.4.10	Overpasses	
10.4.11	2400 South Section	
10.4.12	State Street Section	
10.4.13	900 West Section	

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
10.4.14	1300 South Section	
10.4.15	600 South Section	
10.4.16	600 North Section	
10.4.16.1	600 North/I-15 Interchange Improvements	
10.4.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
10.4.17	Team Track	
10.4.18	<i>Not Used</i>	
10.4.19	<i>Not Used</i>	
<b>10.5</b>	<b>Survey Data &amp; Mapping</b>	<b>M</b>
10.5.1	General Information	
10.5.2	I-15 Corridor Survey Report	
10.5.3	I-15 Corridor Survey Control Drawings (CADD Files)	
<b>10.6</b>	<b>Traffic Studies</b>	<b>M</b>
10.6.1	<i>Not Used</i>	
10.6.2	<i>Not Used</i>	
10.6.3	<i>Not Used</i>	
10.6.4	<i>Not Used</i>	
10.6.5	<i>Not Used</i>	
10.6.6	<i>Not Used</i>	
10.6.7	5300 South Section	
10.6.8	4500 South Section	
10.6.9	3300 South Section	
10.6.10	<i>Not Used</i>	
10.6.11	<i>Not Used</i>	
10.6.12	<i>Not Used</i>	
10.6.13	900 West Section	
10.6.14	<i>Not Used</i>	
10.6.15	<i>Not Used</i>	
10.6.16	<i>Not Used</i>	
10.6.17	<i>Not Used</i>	
10.6.18	<i>Not Used</i>	
10.6.19	<i>Not Used</i>	
<b>10.7</b>	<b>Noise Studies</b>	<b>R</b>
10.7.1	<i>Not Used</i>	

<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
10.7.2	<i>Not Used</i>	
10.7.3	<i>Not Used</i>	
10.7.4	9000 South Section	
10.7.5	7200 South Section	
10.7.6	Railroad Grade Separation at 10600/9000 and 9150 South	
10.7.7	5300 South Section	
10.7.8	4500 South Section	
10.7.9	3300 South Section	
10.7.10	<i>Not Used</i>	
10.7.11	<i>Not Used</i>	
10.7.12	State Street Section	
10.7.13	<i>Not Used</i>	
10.7.14	<i>Not Used</i>	
10.7.15	600 South Section	
10.7.16	600 North Section	
10.7.16.1	600 North/I-15 Interchange Improvements	
10.7.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
10.7.17	<i>Not Used</i>	
10.7.18	<i>Not Used</i>	
10.7.19	<i>Not Used</i>	
<b>10.8</b>	<b>Section Design Consultants Drainage Reports</b>	<b>R</b>
10.8.1	<i>Not Used</i>	
10.8.2	<i>Not Used</i>	
10.8.3	<i>Not Used</i>	
10.8.4	9000 South Section	
10.8.5	7200 South Section	
10.8.6	Railroad Grade Separation at 10600/9000 and 9150 South	
10.8.7	5300 South Section	
10.8.8	4500 South Section	
10.8.9	3300 South Section	
10.8.10	<i>Not Used</i>	
10.8.11	2400 South Section	
10.8.12	State Street Section	
10.8.13	900 West Section	
10.8.14	1300 South Section	

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
10.8.15	600 South Section	
10.8.16	600 North Section	
10.8.16.1	600 North/I-15 Interchange Improvements	
10.8.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
10.8.17	Team Track	
10.8.18	<i>Not Used</i>	
10.8.19	9000 South Frontage Road Connections	
<b>11.0</b>	<b>Reference Documents</b>	
11.1	Report on Historical Geotechnical Data	R
11.2	Quantity Estimates	R
11.2.1	<i>Not Used</i>	
11.2.2	<i>Not Used</i>	
11.2.3	<i>Not Used</i>	
11.2.4	9000 South Section	
11.2.5	7200 South Section	
11.2.6	Railroad Grade Separation at 10600/9000 and 9150 South	
11.2.7	5300 South Section	
11.2.8	4500 South Section	
11.2.9	3300 South Section	
11.2.10	Overpasses	
11.2.10.1	2700 South Overpass	
11.2.10.2	3900 South Overpass	
11.2.10.3	Vine Street Overpass	
11.2.11	2400 South Section	
11.2.12	State Street Section	
11.2.13	900 West Section	
11.2.14	1300 South Section	
11.2.15	600 South Section	
11.2.16	600 North Section	
11.2.16.1	600 North/I-15 Interchange Improvements	
11.2.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
11.2.17	Team Track	
11.2.18	<i>Not Used</i>	
11.2.19	9000 South Frontage Road Connections	
11.3	Drawings of Existing Facilities	R

<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
11.4	I-15 Corridor Evaluation of Soil Strength Gain Due to Embankment Loading	R
11.5	Weather Data	R
11.6	Drainage Study for the I-15 Corridor 10800 South to 500 North	R
11.7	Lighting Report	R
11.8	Parallel Streets Study	R
11.9	Historical Air Quality Readings and Monitoring Station Location	R
11.10	I-15 Corridor CPT Correlations of Pile Load Test	R
11.11	I-15 Corridor Bridge Embankment Settlement Estimates	R
11.12	I-15 Corridor Wick Drain Spacing Report	R
11.13	Department Signing Policies and Procedures	R
11.14	404 Wetland Permit Submittal Attachments	R
11.15	Engineering Study of the 10600 South/I-15 Interchange	R
11.16	UDOT/DEQ Memorandum of Understanding	R
11.17	Maintenance of Traffic Report and MINUTP Data Sets	R
11.17.1	Maintenance of Traffic Report	
11.17.2	MINUTP Data Sets (Electronic Files)	
11.18	Agreements with Department of Environmental Quality, Division of Environmental Response and Remediation	R
11.18.1	Release Site EHBO, Ryder Truck Rental. DEQ/DERR Letter of November 13, 1996	
11.19	1995 Concrete Pavement Condition Report, Volume One	R
11.20	1995 Concrete Pavement Condition Report, Volume Two: Appendices	R
11.21	Draft Materials Manual of Instruction, Part VIII-B, Pavement Management and Design, dated 10/31/96	R
11.22	Maintenance Handbook	R
11.23	<i>Not Used</i>	
11.24	<i>Not Used</i>	
11.25	Request for Proposals to Supply ATMS Equipment	R
11.26	Sampling and Analysis Plan	R
11.27	Health and Safety Plan	R
11.28	Traffic Report	R
11.29	Salt Lake Area I-15 ATMS Traffic Signal Requirements	R
11.30	Salt Lake Area I-15 ATMS Communications System Requirements	R
11.31	Salt Lake Area I-15 ATMS Design Requirement	R
11.32	I-15 Corridor Traffic Signal Design Volume Report	R
11.33	Implications for Pile Design on the I-15 Corridor Based on BYU full-Scale Pile group Lateral Load Testing	R

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
11.34	Guideline and Checklist for Design of Signalized Intersections	R
<b>12.0</b>	<b>Environmental Documents</b>	<b>M</b>
12.1	ROD	M
12.2	<i>Not Used</i>	M
12.3	FEIS	M
12.4	Final Environmental Document for Categorical Exclusion, Railroad Grade Separations at 10600 South, 9150 South & 9000 South, I-15 9000 South East Side Frontage Road Connections	M
12.5	600 North Street Bridge Replacement and Interchange Improvements Final Environmental Study	M
12.6	600 North Street Bridge Replacement and Interchange Improvements Final Section 4(f) Evaluation	M
12.7	600 North/I-15 Interchange Improvements Final Environmental Study	M
<b>13.0</b>	<b>Environmental Permits</b>	
13.1	Air Quality	M
13.2	404 Permits	M
13.3	Contractor Staging Areas	M
13.4	DWQ	M
<b>14.0</b>	<b>Contaminant Management</b>	
14.1	Scope	M
14.2	Applicable Standards and References	M
14.3	General Information	M
14.4	Requirements	M
14.5	Submittals	M
14.6	Evaluation	M
<b>15.0</b>	<b>Coordination, Agreements &amp; Letters of Understanding</b>	
15.1	Utilities	
15.1.1	Utility Agreements	M
	Group B Exhibits	
15.1.2	List of Utility Contacts	R
15.1.3	Supplemental Agreements	M
15.1.4	Worksheet for Supplemental Agreement for Utility Groups A and B	M

<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
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15.2	<i>Not Used</i>	
15.3	Railroad	
15.3.1	Railroad Contacts	R
15.3.2	Railroad Coordination	M
15.3.3	Correspondence	R
15.3.4	Crossing Permits	M
15.3.5	Permits and Applications	M
15.3 Attachment 1	UPRR Pipeline Crossing Permit Application	
15.3 Attachment 2	UPRR Wireline Crossing Permit Application	
15.3 Attachment 3	SPLRR Pipeline (Non-Flammable) Crossing Permit Application	
15.3 Attachment 4	SPLRR Pipeline (Flammable) Crossing Permit Application	
15.3 Attachment 5	SPLRR Wireline Crossing Permit Application	
15.3 Attachment 6	SPLRR Private Roadway Crossing Application	
15.3 Attachment 7	UTA Application for Utility Crossing Permit	
15.3 Attachment 8	UTA Application for Right of Entry	
15.3 Attachment 9	UTA Application for Construction on Railroad Property	
15.3 Attachment 10	UPRR Application for Right of Entry	
15.3.6	Meeting Minutes and Correspondence	R
15.3 Attachment 11	Team Track and Sugar House Spur	
15.3 Attachment 12	Right of Entry SPLRR	
15.3 Attachment 13	RR Right of Entry	
15.3 Attachment 14	UPRR Meeting	
15.3 Attachment 15	UPRR Meeting/Farwest Steel	
15.3 Attachment 16	Farwest Steel Spur Relocation	
15.3 Attachment 17	SPLRR Railroad Conflicts	
15.3 Attachment 18	UPRR Bridge Structure Submittal	
15.3 Attachment 19	Utah Transit Authority (Additional Track)	
15.3 Attachment 20	SPLRR Railroad Coordination	
15.3 Attachment 21	SPLRR Team Track Meeting	
15.3 Attachment 22	UTA Letter Proposed Additional Track	
15.3 Attachment 23	UDOT and SPLRR Conceptual Approval of the Team Track Location	
15.3 Attachment 24	SPLRR Concerns	
15.3 Attachment 25	SPLRR Team Track Relocation	
15.3 Attachment 26	SPLRR Forced Account Work	

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
15.3 Attachment 27	UPRR Company Letter of November 13, 1996	
15.3 Attachment 30	700 West Street Realignment Meeting Minutes	
15.3 Attachment 31	700 West Street Realignment - Figure	
15.3 Attachment 32	900 West Track and Road Relocation	
15.3 Attachment 33	Letter from UPRR - Working Windows	
15.3 Attachment 34	UPRR, UDOT, & PB Meeting Minutes	
15.3 Attachment 41	UTA Proposed Alignment of Two Future Track - Figure	
15.3 Attachment 42	UTA Comments on the Phase I Design Plans	
15.3 Attachment 43	UPRR Comments on the Phase I Design Plans	
15.3 Attachment 44	UPRR, South Jordan & PB - Gateway Entrance to the City	
<b>16.0</b>	<b>Right-of-Way &amp; Easements</b>	<b>M</b>
16.1	Status/Schedule of Acquisition	M
16.2	Maps	M
16.2 Attachment 1	Specific Information on Potential Demolition parcels, dated December 4, 1996.	
16.2 Attachment 2	Shotgun values for 108 Parcels, Appraisal Report, dated November 1, 1995	
16.3	Procedure for Right-of-Way Acquisition	M
Appendix A	I-15 Corridor Right-of-Way Acquisition Schedule (Amended) Appendix A Attachment 1	
Appendix B	9000 South Frontage Road Connections Right-of-Way Acquisition Schedule (Amended), dated December 16, 1996. Appendix B Attachment 1	
Appendix C	600 North Interchange Improvements Right-of-Way Acquisition Schedule (Amended), dated December 16, 1996 Appendix C Attachment 1	
Appendix D	600 North Railroad Viaduct and South Bound Ramps Improvements Right-of-Way Acquisition Schedule (Amended), dated December 16, 1996 Appendix D Attachment 1	
Appendix E	Railroad Grade Separations at 10600, 9150 and 9000 South Right-of-Way Acquisition Schedule (Amended), dated December 16, 1996 Appendix E Attachment 1	

<b><u>File Number</u></b>	<b><u>Name/Title</u></b>	<b><u>Document Designation</u></b>
<b>17.0</b>	<b>Public Information</b>	
17.1	Background and Current Efforts	R
17.2	Contractor Public Information Requirements	M
17.3	Submittals	M
17.4	Basis of Proposal Evaluation	M
<b>18.0</b>	<b>Contractor Design &amp; As-Built Documents</b>	M
<b>19.0</b>	<b>Monitoring of Commitments</b>	
19.1	Environmental	M
19.2	Local Government	M
19.3	Utilities	M
19.4	Noise Walls	M
19.5	Railroads	M
19.6	<i>Not Used</i>	
19.7	Drainage	M
<b>20.0</b>	<b>Phase I Design</b>	R
20.1	Basis of Design	
<b>20.2</b>	<b>Design Study Reports</b>	R
20.2.1	<i>Not Used</i>	
20.2.2	<i>Not Used</i>	
20.2.3	<i>Not Used</i>	
20.2.4	9000 South Section	
20.2.5	7200 South Section	
20.2.6	Railroad Grade Separation at 10600/9000 and 9150 South	
20.2.7	5300 South Section	
20.2.8	4500 South Section	
20.2.9	3300 South Section	
20.2.10	Overpasses	
20.2.11	2400 South Section	
20.2.12	State Street Section	
20.2.13	900 West Section	
20.2.14	1300 South Section	
20.2.15	600 South Section	
20.2.16	600 North Section	
20.2.16.1	600 North/I-15 Interchange Improvements	

<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
20.2.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	
20.2.17	<i>Not Used</i>	
20.2.18	<i>Not Used</i>	
20.2.19	9000 South Frontage Road Connections	
<b>20.3</b>	<b>Master File Index</b>	<b>R</b>
20.3.1	<i>Not Used</i>	
20.3.2	<i>Not Used</i>	
20.3.3	<i>Not Used</i>	
20.3.4	9000 South Section	
20.3.5	7200 South Section	
20.3.6	Railroad Grade Separation at 10600/9000 and 9150 South	
	20.3.6 Attachment 1	
20.3.7	5300 South Section	
20.3.8	4500 South Section	
20.3.9	3300 South Section	
20.3.10	Overpasses	
20.3.11	2400 South Section	
20.3.12	State Street Section	
20.3.13	900 West Section	
20.3.14	1300 South Section	
20.3.15	600 South Section	
20.3.16	600 North Section	
20.3.17	Team Track	
20.3.18	ATMS	
20.3.19	9000 South Frontage Road Connections	
20.3.20	I-15 Corridor General	
20.4	9000 South Section, 90_96	<b>B</b>
	20.4 Attachment A 1000 South Design Option	
20.5	7200 South Section, 72_96	<b>B</b>
	20.5 Attachment 1 Noise Wall "L" Location	
20.6	Railroad Grade Separation at 10600/9000 and 9150 South	<b>S</b>
20.7	5300 South Section, 53_96	<b>B</b>
20.8	4500 South Section, 45_96	<b>B</b>
20.9	3300 South Section, 33_96	<b>B</b>
20.10	Overpasses, OP_96 S	

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<u>File Number</u>	<u>Name/Title</u>	<u>Document Designation</u>
20.11	2400 South Section, 24_96	
20.12	State Street Section, SS_96	B
20.13	900 West Section, 09_96	B
20.14	1300 South Section, 13_96	B
20.15	600 South Section, 06_96	B
20.16	600 North Section	B
20.16.1	600 North /I-15 Interchange Improvements	S
20.16.2	600 North Railroad Viaduct and Southbound Ramp over I-15	S
	20.16 Attachment 1 Cross Sections	S
	20.16 Attachment 2 List of Corrections to Drawings	
20.17	Team Track, TT_96	
20.18	ATMS	S
20.19	9000 South Frontage Road Connections	B
20.20	I-15 Corridor General	S
		R
21.0	<b>Software, Electronic Files &amp; Communications</b>	
21.1	Software Requirements	
21.2	Formats	M
21.3	Communications	M
21.4	CADD Standards	M
		M

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## **APPENDIX D**

# **TECHNICAL EVALUATION CRITERIA**

## **TECHNICAL SOLUTIONS**

### **MAINTENANCE OF TRAFFIC**

Evaluation of the proposal will be based on the thoroughness and clarity with which the scope, extent, methodology and tools are used to provide for the maintenance of traffic through the project area during construction to maximize the movement of people, goods and services while minimizing negative impacts to residents, commuters and businesses.

Specifically the Department will evaluate the proposers:

- Understanding of the traffic operations in the Salt Lake Valley
- Provisions for motorist, general public, department and contractor safety as part of the management of traffic plan concepts to maximize capacity through the construction zones of the project above the minimums stated in the performance specifications.
- Staffing for adequacy to manage traffic control in the construction zones
- Proposed methods for notifying the Department and motorists of closures, detours and route alterations
- Process to notify those involved with emergency response to reduce the period of or effect on capacity of allowable closures and detours
- Plan for use of the ATMS system and its use in managing traffic
- Plan for a courtesy patrol
- Understanding of local jurisdictional concerns associated with management of traffic on the I-15 corridor

### **Geotechnical**

The proposal will be evaluated by the Department for:

- Approach to addressing settlements (total, secondary and differential; settlements in both transverse and longitudinal directions)
- Innovations to address geotechnical issues
- Proposed foundation systems
- Approach to construction from a geotechnical perspective
- Proposed instrumentation plan
- Proposed load testing plan
- Approach to addressing distress to structures/properties adjacent to the corridor.

## **Structures**

Evaluations of technical proposals will be based on:

- Soundness in the selection of structure type, durability of structural type and components in resisting corrosion
- Ease and cost of maintainability for extended structure life
- Quality of materials proposed for structural components
- Seismic strategy used for maintaining safety, function and serviceability of structures
- Ease of structure inspection in identifying defects and deterioration
- Life-cycle cost analysis
- How well the structures compliment and contribute to the overall Project goals of time, quality and cost

## **Pavement**

The Department is particularly interested in a pavement section that deals with surface and subsurface drainage, frost and trapped water that would perform for the design life with minimal maintenance. Therefore, the proposal will be evaluated by the Department for:

- Technical approach to addressing anticipated settlements
- Pavement design as it relates to other geotechnical issues
- Pavement design as it relates to construction issues (i.e. load transfer, joints, corrosion resistance)
- Durability
- Maintainability and anticipated maintenance
- Proposed design personnel
- Technical approach to handling surface and subsurface drainage

## **Maintainability**

This subfactor will be evaluated on:

Integration of maintenance concerns into the design and construction processes, especially for pavement, embankment, structures, drainage, snow/ice removal and other items of concern noted in the RFP Section 3.4.5.1.5, namely

- Design considerations for snow and ice removal
- The planned design life for the pavement and its relationship to long term surface
- Deterioration or rutting
- The impact of materials and consolidation and compaction design and construction and their impact on differential settlement between existing and new embankments
- Snow storage capacity of the corridor pavements and retaining walls coupled with the capacity and placements of the drainage system to handle snow melt

- Structure decking and joint design and their long term maintenance requirements
- The design of the structures/approach slabs and the relationship to short term (first five years) and long term settlement
- The efficiency of maintenance of certain infrastructure elements, such as,
- Mechanical glare screens and modified Jersey barriers; wall facings and their durability to graffiti removal; plowability of pavement markings verses marking life and reflectivity; the scope, kinds and types of landscaping and the ease of maintenance; and the serviceability of storm water detention/pumping systems
- Maintenance accessibility for equipment, mowing, litter control, chemical spraying, etc.
- Nature and extent of maintenance activities anticipated over the first 20 years after construction

#### **Others**

[Aesthetics, Drainage, Roadway Geometrics, Lighting, Traffic Signals, Signing, Water Quality, Harmful/Hazardous Material Remediation, Concrete Barriers, and ATMS]

#### **a) Aesthetics**

The Contractors Proposal will be evaluated on how well the proposed concepts incorporate the intent (RFP Section 6.11.3.1) and philosophy (RFP Section 6.11.3.2) and meet or exceed the baseline set forth in the guidelines. Proposals will also be evaluated according to the criteria established in RFP Section 6.11, and evidenced design excellence in the generation of design concepts. The primary areas of evaluation will be:

- Excellence, creativity, clarity, and innovation, as expressed in the Aesthetic and Landscape Concept Design Report
- Cost effectiveness of design concept
- Compliance with the criteria set forth in the Guidelines
- The plan for accommodating cities aesthetic interests within the design process
- Qualifications of design team
- Provision of a unified and consistent visual experience that integrates engineering, landscape, and urban design components of the Project
- Provision of landscape treatments that are sustainable, while responding to aesthetic, maintenance, and safety considerations
- Provision of supplemental elements

#### **b) Drainage**

The proposal will be evaluated based on:

##### **a. Quality of responses to meet the criteria in RFP Section 6.1.1:**

- Well drained corridor
- Safety
- Functionality
- Durability



- Maintainability
- Protection against vandalism
- b. Understanding of the requirements of the permits listed in RFP Section 6.1.4.1:
  - Utah State Engineers Stream Alteration Permit
  - DWQ Construction Permit
  - UPDES General Storm Water Discharge Permit
- c. The efficient use of pumping.
- d. Quality of other responses required by RFP Section 6.1.4.1:
  - Divergence from Phase I Design reports and design
  - Software
  - Methodology
  - Pumps
  - Material testing strategy for pipe selection
  - QC/QA applied to design and construction of drainage facilities

Favorable consideration will be given for the solutions and/or economic betterments that improve upon the solutions presented in the Phase I Design.

**c) Roadway Geometrics**

Basic Configuration Changes submitted with the proposal in accordance with RFP Section 6.2.4.2, will be evaluated by the Department for their ability to increase benefits or savings to the public and/or the Department, improve maintenance of traffic, and/or expedite construction, without impairing essential functions and characteristics of the project including but not limited to safety, traffic operations, desired appearance, and maintenance operations.

**d) Lighting**

The lighting proposals will be evaluated on:

- Adequacy of illumination
- Power and lighting efficiency
- Safety to travelers and maintenance personnel
- Maintainability
- Durability
- Innovation

**e) Traffic Signals**

The traffic signals proposal will be evaluated based on the quality, thoroughness, and clarity of the statement of understanding of the traffic signal work.

**f) Signing**

The evaluation will be based on the thoroughness, quality, and consistency of the stated understanding of the signing work and the process for its implementation. The

proposal shall also be evaluated for its consistency with the requirements of RFP Section 6.7.

**g) Water Quality**

The proposal will be reviewed for the thoroughness and clarity of its understanding of and process for addressing water quality and related permit requirements.

**h) Harmful/Hazardous Material Remediation**

The proposal will be evaluated for general understanding of issues related to hazardous and harmful materials remediation, approach to ensuring regulatory compliance, minimizing risk to the Department, and minimizing exposure to workers and the general public.

**i) Concrete Barriers**

The proposal will be evaluated based on the thoroughness and effectiveness in providing for:

- Safety
- Emergency access
- Glare control
- Mitigating aesthetic impacts

**j) ATMS**

Evaluations of technical proposals will be based on the clarity and thoroughness of the proposers understanding of the scope and extent of the ATMS work, the approach to accomplishing the ATMS work, and the proposed practices for the design and implementation of the Advanced Traffic Management System.

**WORK PLAN/SCHEDULE**

The Work Plan/Schedule will be evaluated based on its:

- Meeting the completion deadline and other schedule constraints contained in the RFP
- Clarity of proposers work breakdown structure
- Logical sequencing and integration of activities and phases within Work Segments and within the Project as a whole
- Consistency with proposers MOT plans and management approach and organization
- Reasonableness of durations and production rates
- Integrating the operations of the proposers team
- Adequately addressing the interrelationships of design, construction and maintenance
- Clarity of presentation of work plan/schedule (Graphical displays and narrative description)

## **MANAGEMENT**

The Management proposal will be evaluated on the following:

- Management capabilities
- Procedures to control and coordinate work of subcontractors
- Procedures for interfacing with the Department, its consultant(s), and Federal, State and local agencies
- The overall ability and experience of management personnel
- Organizational structure as illustrated by charts and narrative for all phases of the project
- Proposed management system to control and coordinate the cost & schedule
- Proposed approach to project control
- Consistency with Work Plan/Schedule
- Processes for integrating design, construction and maintenance aspects of the Project.
- Concept of design management and coordination
- Maintenance management plan and organization for maintenance
- Outline of anticipated maintenance activities as requested in RFP Section 3.4.5.2.2.

### **Quality Management Program**

- Contractors self-assessment with respect to ANSI/ASQC Q9001 and planned steps to achieve registration
- Steps proposed to be taken and when to provide design services in conformance with Q9001 during the initial 12 month period of the Contract
- Summary of QC/QA plans for design, construction and maintenance (during and after construction)
- Planned QA & QC organizations
- Plans for mobilizing its QC/QA organization to be responsive to planned schedule
- Procedures for coordination of design, construction and maintenance activities  
Performed by different firms to ensure consistency and quality
- Procedures to provide QC/QA during early phases of design and construction prior to approval of QMPs

### **Subcontracting and DBE Performance Plan**

The evaluation of the subcontracting and procurement plan will consider:

- The competitive bidding and solicitation plan for subcontractors and suppliers
- Information provided on Forms D, E and H.
- Subcontracting plan provides a range of opportunities for subcontractors of different capacities. The Departments goals are:
  - \$20 million but not over \$40 million      1-4 subcontracts
  - Over \$10 million but less than \$20 million      4-8 subcontracts
  - \$3 million but less than \$10 million      10-20 subcontracts
- Opportunities for smaller subcontractors evidenced by total value of planned

Subcontracts under \$3 million

- Subcontracting plan does not favor or exclude local subcontractors
- Proposed DBE participation efforts are in accordance with requirements of Appendix F to Contract Provisions, RFP Section 4.0.
- Coordination with Agencies
- The evaluation will consider:
  - Plan for coordination with Federal, State and local agencies and governments
  - Plan for establishing and maintaining working relationships with Utility Owners
  - Plan for coordinating design and construction schedule for utilities

### **Community Relations**

For Public Information:

Evaluation of the proposal will be based upon the thoroughness and clarity of the plans presented, specifically as to:

- Qualifications and experience of proposed key staff members.
- Desire and ability of Proposer to cooperate with the Department in a dynamic team relationship.
- Productiveness, efficiency, and resourcefulness of Contractors proposed actions.
- Innovative recommendations for additional strategies.
- The evaluation will also be based on:
  - Responsiveness of MOT plans to community concerns
  - For air quality:
    - Responsiveness of air quality emissions control plans to community concerns
    - Proposed adjustments to operations in response to ambient air quality alerts

### **Safety**

The evaluation will consider:

- Proposed safety plan
- Qualifications and experience of safety personnel
- Proposed public safety plan
- Information contained in Appendix C, Safety Questionnaire, submitted in response to the RFQ

## **ORGANIZATIONAL QUALIFICATIONS**

The ratings received during evaluation of the Statements of Qualifications submitted in response to the Request for Qualifications (RFQ), dated May 30, 1996, will be re-evaluated based on additional information submitted with the Proposal. Additional information will be evaluated in accordance with RFP Section 3.5.6 after examination of the SOQ ratings and comparison with the information submitted with the SOQ.

### **Legal and Financial**

The following pass/fail criteria apply:

- Business form(s) of proposers and team members (must be viable entity for entire duration of the Project, including maintenance after construction)
- Financial data meets the \$350 million test

The following subjective criteria apply:

- Major Participants meet the \$100 million test
- Financial data exceeds the \$350 million test
- Strength of credit rating

### **Organization and Experience**

The Department will re-evaluate the capabilities of the Proposer organization and its key staff members to effectively manage and deliver the Project. The following attributes of the proposer will be considered and SOQ ratings adjusted, as appropriate, based on information provided in/with Form B:

- Single point of contact for the Department
- Capability of organization to perform the required tasks, including specified maintenance
- Experience of key management staff
- Experience in the design, construction, reconstruction and maintenance of highways and structures
- Experience in successfully integrating project components
- Experience with design/build contracts (highway and others)
- Experience with interstate highway projects, including any in Utah
- Design and construction capacity, including current design and construction backlog
- Experience of Major Participants working together as a team, including any design/build contracts

### **Project Approach**

No update of SOQ information is required. The proposers Project Approach will be re-evaluated and rated based on information submitted in accordance with RFP Sections 3.5.5.1 through 3.5.5.3 and RFP Sections 6.0, 9.0, 14.0, and 17.0.

## **Past Performance**

To minimize the risk to the Department that quality and/or schedule problems will arise during the progression of the work, the Department will consider the performance history of the proposer and the level of customer satisfaction achieved by its participants on previous projects.

The following attributes of the Proposer will be considered and SOQ ratings adjusted, if appropriate, based on information submitted in/with Form B:

- Record of cost and schedule growth (or reduction), including experience with mechanisms to achieve goals of avoiding delays and minimizing claims
- History of litigation, termination for cause, and payment of liquidated damages
- Record of meeting regulatory requirements: safety, disadvantaged business enterprise participation, EEO, etc.
- Quality and relevance of references
- Ratios of change orders and claims to total project costs
- Methods for addressing claims, contract modifications, and schedule recovery to maintain the completion date while minimizing additional costs to the Department and the project
- Previous experience in performing under Award Fee contracts and ratings earned

## **PRICE EVALUATION**

Price proposals will be evaluated for:

- Price realism, i.e., are proposed prices consistent with RFP requirements;
- Reasonableness of allocation of prices to Price Elements and distribution of prices to activities
- Integration of and consistency among the Price Proposal and proposers WBS in the price-loaded Baseline Plan
- Price-loaded Baseline Plan facilitates the future payment progress procedures (RFP Section 2.2.6)
- Accuracy of Forms K through K-6.
- If there is a discrepancy between the information represented on the Pricing Forms and the Baseline Plan submitted with the price proposal, the information on the Pricing Forms shall govern.

## **APPENDIX E**

## **OPTIONS**

Option A is a package of six (6) individual options consisting of an Initial Maintenance Term option of five (5) years and a set of five (5) successive one-year options to extend the Maintenance Term beyond the initial Maintenance Term.

Option B concerns shortening the lengths of the viaducts at 400 South, 500 South and 600 South.

Option C concerns construction of an improved diamond interchange at 10600 South.

Option D concerns construction of a single point urban interchange (SPUI) instead of an improved diamond interchange at 10600 South.

Option E involves deletion of the noise walls on the west side of the corridor between Sta 15+750 and Sta 16+450 in Midvale.

Option F concerns the design and construction of an additional box culvert at Mill Creek

Option G concerns the design and construction of an additional box culvert at Dry Creek

Option H concerns the design and construction of an underpass at 10000 South.

Option I involves designing and constructing Fiber Optic Utility Conduit along the Corridor.

Option J involves the lump sum price change to provide bridge structures, retaining walls and related facilities instead of the embankment and retaining walls indicated on the phase I design.

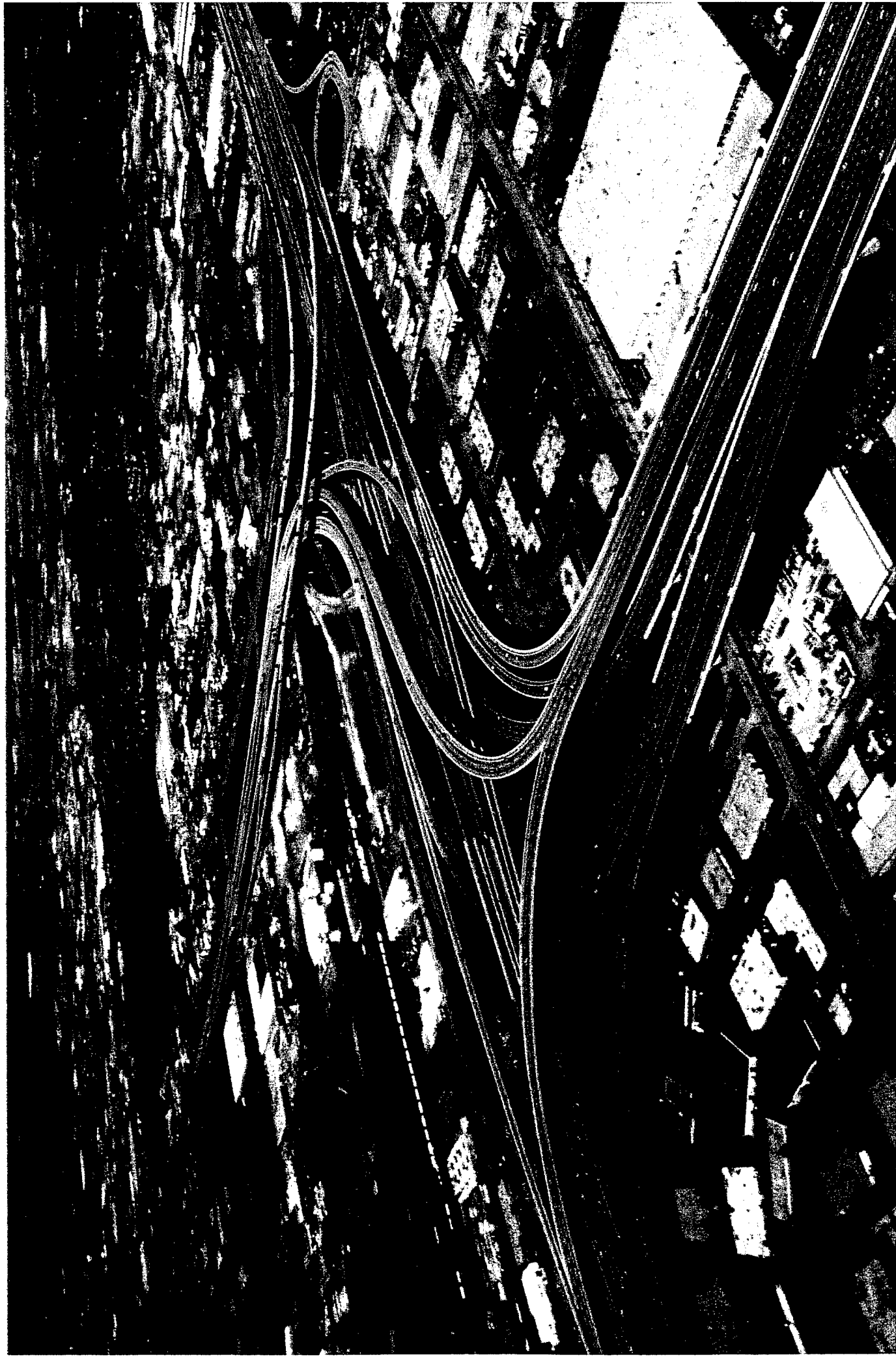


## **APPENDIX F**



# I-80 / I-15 / SR-201

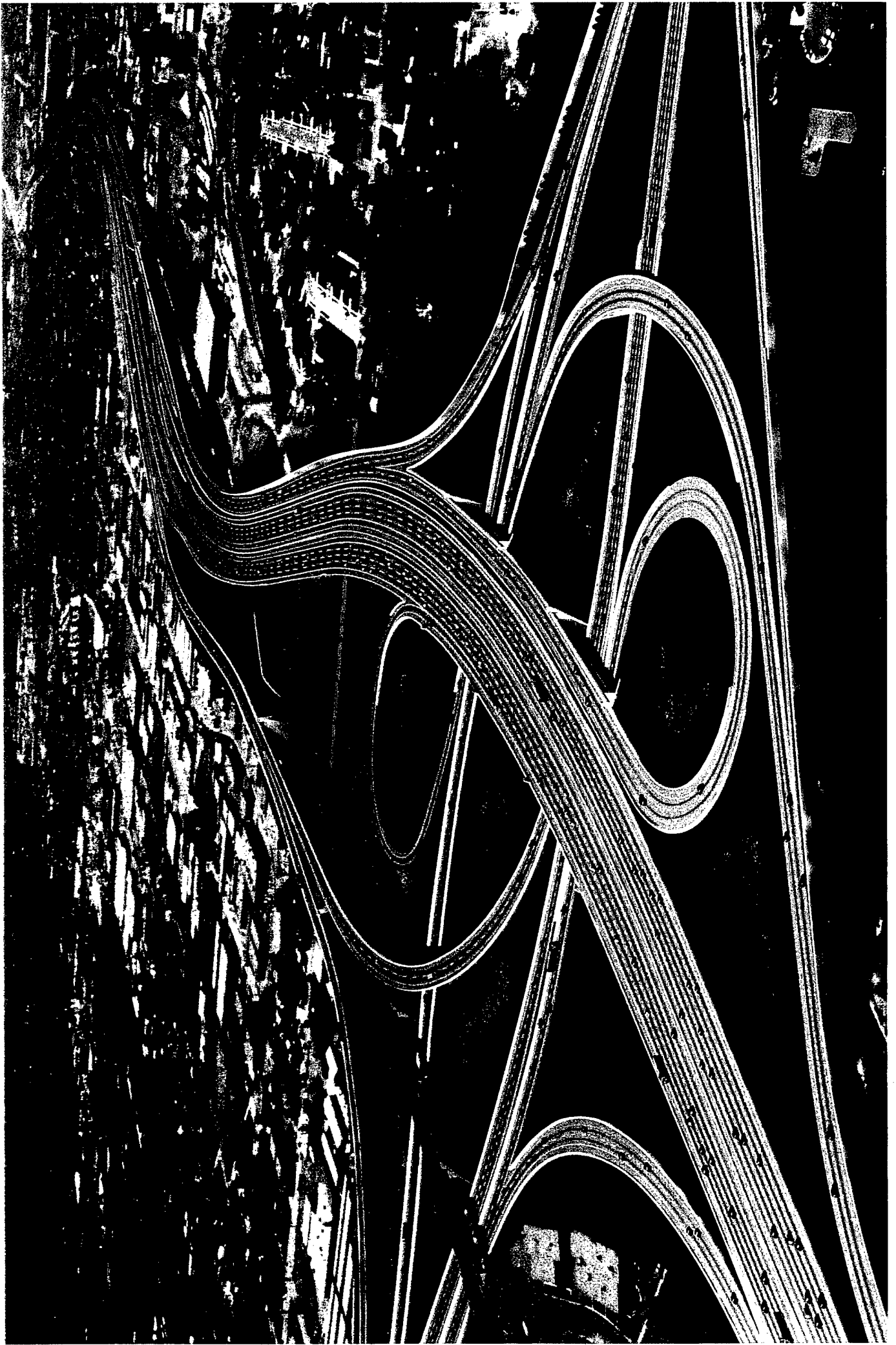
INTERSTATE 15  
RECONSTRUCTION



# I-15 / I-215 / South Junction



INTERSTATE 15  
RECONSTRUCTION



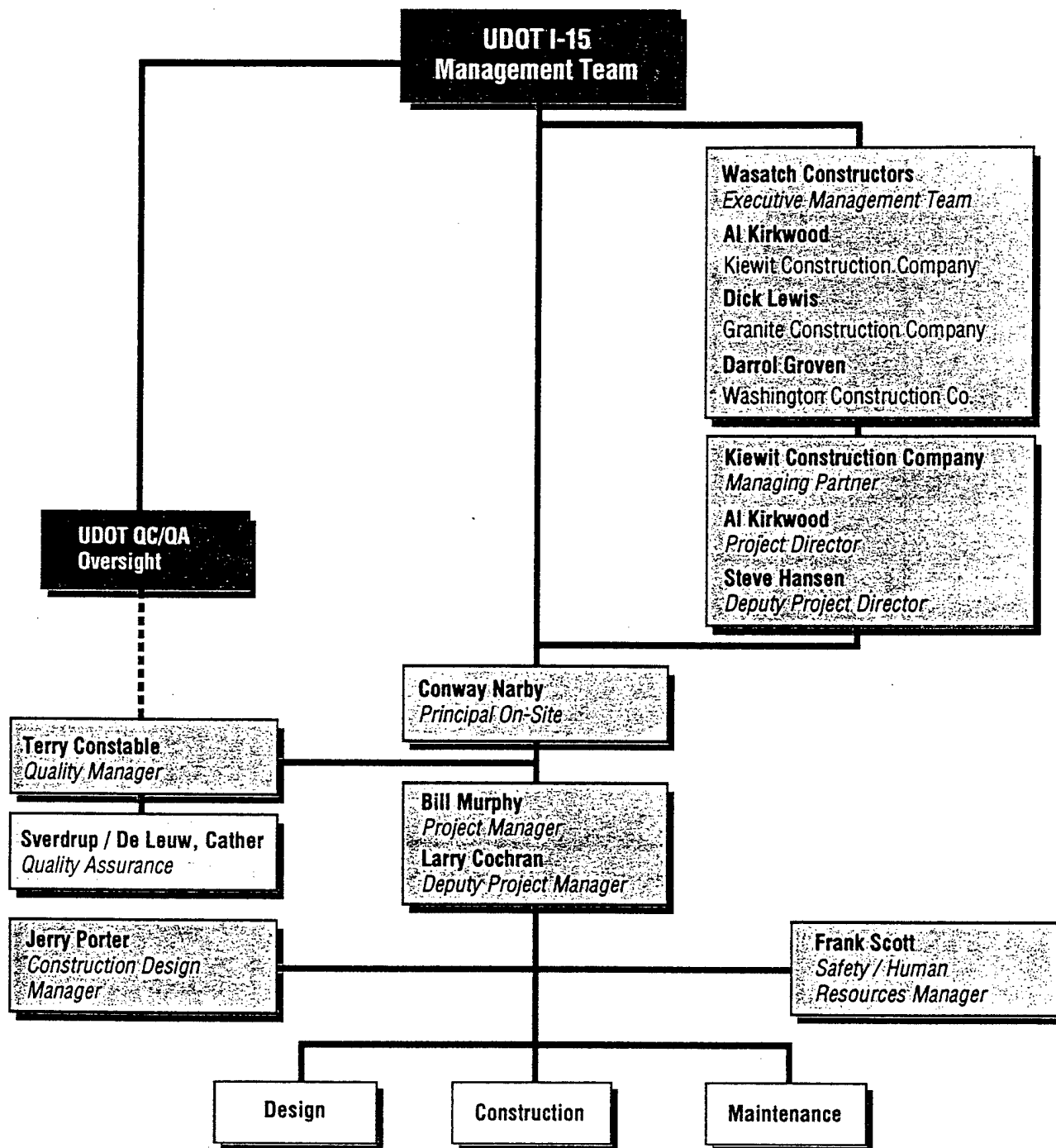
# I-80 / I-15 / Downtown Access



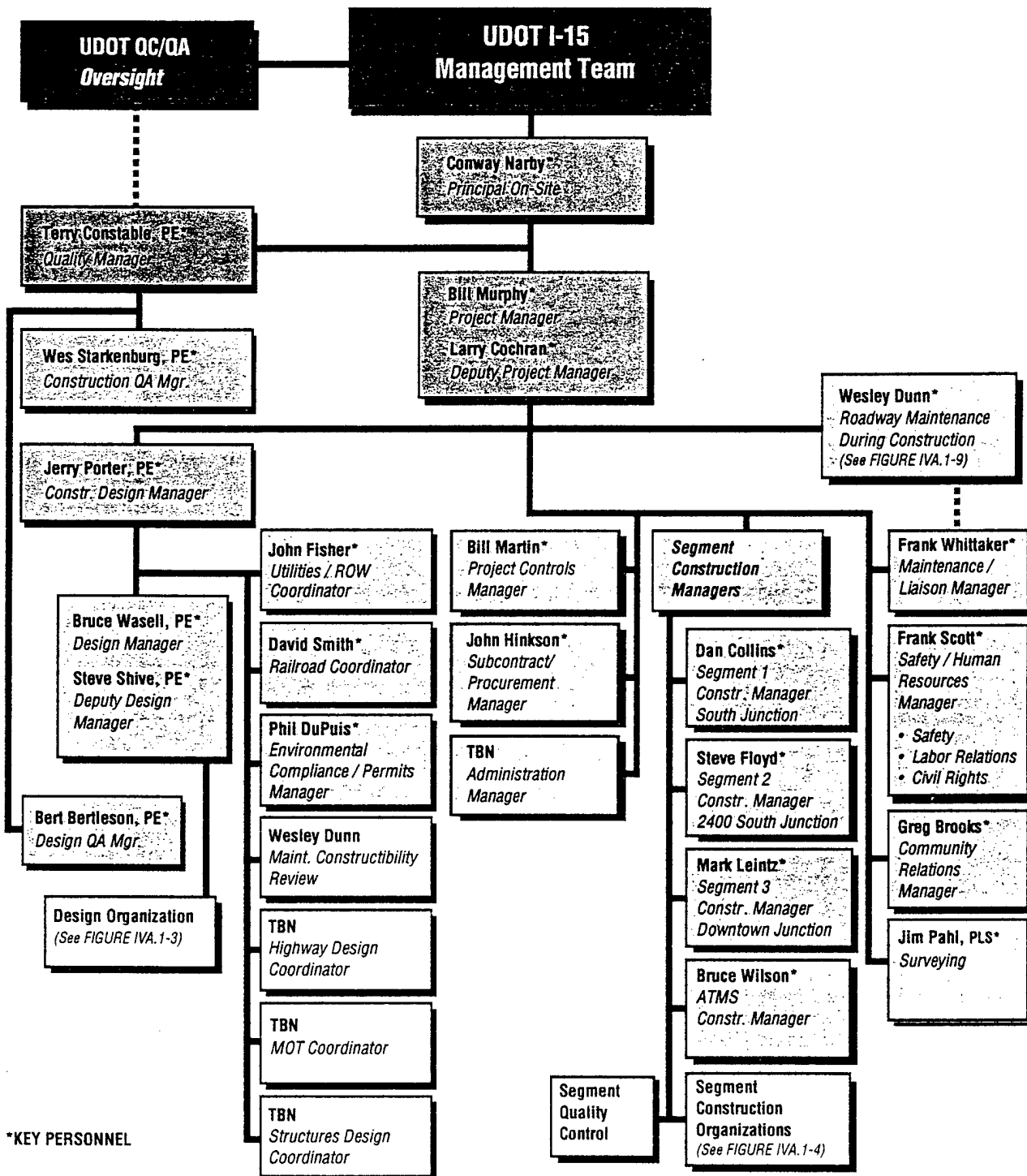
INTERSTATE 15  
RECONSTRUCTION



## **APPENDIX G**



OVERALL PROJECT  
MANAGEMENT TEAM



\*KEY PERSONNEL

# DESIGN / BUILD / MAINTENANCE ORGANIZATION CHART



## DESIGN ORGANIZATION CHART



## **APPENDIX H**

# I-15 CORRIDOR RECONSTRUCTION PROJECT AWARD FEE ORGANIZATION

Tier 3

Fee Determination Official  
Executive Director of UDOT

Partnering  
Board

Tier 2

Award Fee Oversight  
Committee  
Department Deputy Director\*  
I-15 Project Director\*  
Deputy Project Director\*\*  
Principal On-Site\*\*

Tier 1 Performance Evaluators

**Design**  
Deputy Project Director\*  
Technical Support Manager\*  
Deputy Project Manager\*\*  
Construction Design  
Manager\*\*

**Construction**  
Deputy Project Director\*  
Construction Oversight  
Manager\*  
Project Manager\*\*  
QA Manager\*\*

**Public Information**  
Public Information Director\*  
Community Relations  
Manager\*\*

**Segment 1**  
Oversight  
Manager\*  
Segment  
Manager\*\*  
Segment QA  
Manager\*\*

**Segment 2**  
Oversight  
Manager\*  
Segment  
Manager\*\*  
Segment QA  
Manager\*\*

**Segment 3**  
Oversight  
Manager\*  
Segment  
Manager\*\*  
Segment QA  
Manager\*\*

**ATMS**  
Oversight  
Manager\*  
ATMS  
Manager\*\*  
Segment QA  
Manager\*\*

**Contract  
Administration**  
Contracts  
Administrative  
Manager\*  
Deputy Project  
Manager\*\*

**Performance Monitors**  
As required for sub-elements\*/\*\*

\*UDOT Staff \*\* Wasatch Constructors Staff

## **APPENDIX I**

# *Memorandum*

December 15, 1997

**To:** Thomas R. Warne, Executive Director  
Award Fee Determination Official (AFDO)

**From:** Award Fee Oversight Committee (AFOC)  
Clint Topham, Deputy Director  
David Downs, I-15 Project Director  
Steve Hansen, Deputy Project Director  
Conway Narby, Principal On-Site

**Subject:** AWARD FEE SUMMARY REPORT  
Award Fee Determination Period (AFDP) 1 - NTP to October 31, 1997

The Award Fee Summary Report covers the four award fee criteria elements of Timely Performance, Quality of Work, Management and Public Information/Maintenance of Traffic. The total fee available to be earned by Wasatch Constructors in AFDP 1 is \$500,000 for Timely Performance and \$2,000,000 for the "other three criteria elements". Based upon the performance documentation included in this report, the Award Fee Oversight Committee recommends a score for Timely Performance of 93.027, resulting in a fee earned of \$490,133 and the composite score for the other three criteria elements of 95.27, resulting in a fee earned of \$2,000,000.

The intent of the award fee process is to establish a superior level of performance for Wasatch Constructors such that earning the total award fee available provides the Utah Department of Transportation and the users of I-15 a product that is the best the highway industry can produce. During the AFDP 1 the superior performance level was established for each criteria element area by documenting those elements being performed at that level (Superior Performance Worksheet) and determining those elements needing improvement (Detractor Worksheet). This information was the basis for determining the performance levels or scores for the Quality of Work, Management and Public Information/Maintenance of Traffic criteria elements. The score for Timely Performance was based upon how well Wasatch performed in relation to their current baseline schedule.

The Award Fee Summary Report is organized by the functional areas involved in evaluating performance - Design, Public Information and Construction. The construction functional area is further divided by Segments - Cottonwood, Jordan, Downtown and ATMS. Each functional area

includes a summary memorandum outlining how they arrived at the performance scores. In addition to the summary, all performance worksheets are provided.

The award fee procedures required performance evaluators to collect data in the form of worksheets from performance monitors in each criteria sub-element to use in determining a score. If agreement on a score was not reached by the evaluators the criteria sub-element performance determination was elevated to reach a score. This process did occur in the Construction functional area/ Downtown Segment for the Quality of Work sub-elements of *Follow the CQMP-QA*, *All Work Meets or Exceeds Contract Requirements*, and *Effective MOT Program*. The score for *Follow the CQMP-QA* sub-element was determined by John Bourne, Deloy Dye and Bill Murphy (see memo to AFOC). The remaining two sub-elements were elevated to the AFOC.

The AFOC reviewed detractors identified for the sub-element *All Work Meets of Exceeds Contract Requirements*. Included with each detractor was a time frame in which the detractor could be eliminated. With this information the AFOC agreed that each detractor had merit and, if resolved within the time line defined, would not have an impact on the project. This evaluation resulted in a score of 92. The sub-element *Effective MOT Program* included a detractor originally identified in July, with a minimal impact on the project. The AFOC agreed with this evaluation and a score of 89 was reached.

As the award fee procedures require, each functional area score has been added to the Composite Scoring Worksheet to determine composite scores by criteria elements. Also, the Award Fee Summary Report worksheet has been completed, which calculates the total award fee earned for AFDP1. These worksheets are included with this summary memorandum.

DRAFT

# AWARD FEE FIELD AUDIT FORM

AUDIT No. \_\_\_\_\_  
(Expedition Assigns )

FUNCTIONAL AREA

☒ Construction - Segment ☐ 1 ☐ 2 ☐ 3 ☐ ATMS

☐ Design ☐ Public Information ☐ Contract Admin.

PERIOD COVERED

AFDP

Month/Year

CRITERIA ELEMENT

CRITERIA SUB-ELEMENT

☐ Quality of Work

MOT

☐ Management

☒ PI/MOT

Sub-Element Process: Traffic Control Program

Schedule Activity ID:

Specification Section:

RFP Section:

Work Process or Procedure: MOT Compliance—Inspection of all closure and flagging operations

TASK	CONF.	NON-CONF.
Review closure/flagging plan		
Verify closure/flagging has been coordinated with other segment(s)		
Verify impacted cities have been notified and all necessary permits have been obtained		
Inspect all trail blazing signs for closure are positioned and legible		
Inspect tapers and signage per plan		
Verify closure complies with MUTCD Part VI and UDOT Sheet 4's		
All deficiencies noted and action taken		

IS THE SUB-ELEMENT PROCESS LISTED ABOVE IN CONFORMANCE?

☐ YES

☐ NO

COMMENTS and SUGESTIONS:

SIGNATURES:

Performance Monitor

DATE:

# SUPERIOR PERFORMANCE WORKSHEET

## Part 1

(Identify functional area, period covered, criteria element and sub-element)

### FUNCTIONAL AREA

☐ CONSTRUCTION (segment)

☐ 1

☒ 3

☐ 2

☐ ATMS

### PERIOD COVERED

AFDP

1

MONTH/YEAR

10-97

### CRITERIA ELEMENT

PI / MOT

### CRITERIA SUB-ELEMENT

EFFECTIVE MOT PROGRAM

## Part 2

(Describe example(s) of superior performance, sign and date worksheet)

### DETAILED DESCRIPTION OF SUPERIOR PERFORMANCE

THROUGHOUT OCTOBER SEGMENT 3 HAS CONTINUED TO MAINTAIN AND IMPROVE UPON THEIR EFFECTIVE MOT PROGRAM. DURING THE MONTH, 500S WAS RESTRIPE TO FACILITATE SNOW REMOVAL OPERATIONS. I-15 WAS CLEANED AND RESTRIPE, AND PLANS HAVE BEEN MADE TO INSTALL A SNOW PLOW TURNAROUND ON I-80.

### DETAILED DESCRIPTION OF SUPERIOR PERFORMANCE

### DETAILED DESCRIPTION OF SUPERIOR PERFORMANCE

SIGNATURE

DATE: 11/7/97

(Milton Gamache)

Walter Kuntz (W.E. STARKENBURG)

Award Fee Procedures

ATTACHMENT F  
**POTENTIAL DETRACTORS WORKSHEET**

(To be completed as part of monthly evaluations by Performance Monitors/Evaluators)

**Part 1**

(Identify functional area, period covered, criteria element and sub-element)

**FUNCTIONAL AREA**

☒ CONSTRUCTION (segment)

☐ 1      ☒ 3

☐ 2      ☐ ATMS

☐ DESIGN

☐ PUBLIC INFORMATION

**PERIOD COVERED**

AFDP

1

MONTH/YEAR

July 1997

**CRITERIA ELEMENT**

PUBLIC INFORMATION / MOT

**CRITERIA SUB-ELEMENT**

Effective MOT program

**Part 2**

(Identify potential detractor, describe potential detractor and impact to project, suggest how to eliminate potential detractor, set timeline for resolution, list resolution when complete, sign and date worksheet)

**DETAILED DESCRIPTION OF POTENTIAL DETRACTOR & IMPACT TO PROJECT**

The detour signing has been implemented slowly and there have been numerous conflicting signs in place when detouring traffic at various locations on the segment. We have also had barrier blunt ends within the clear zone for over a week. This has had a negative impact on the public. It also is a serious safety concern.

**SUGGESTIONS FOR ELIMINATING POTENTIAL DETRACTOR**

A more thorough review of the plans and more timely implementation is needed. QA/QC needs to also review the implementation soon after placement so unforeseen problems and conflicts can be quickly resolved.

**TIMELINE FOR RESOLUTION**

August 1, 1997

**RESOLUTION (including date and project impact)**

☐ No impact    ☒ Minimal impact    ☐ Impact    ☐ Major impact

**SIGNATURE**

**DATE**

7/31/97

J. Brent DeYoung

(Print name under signature)



# ATTACHMENT H

## CRITERIA SUB-ELEMENT SCORING WORKSHEET

### for Construction Functional Area

(To be used by Construction Segment Performance Evaluators in scoring criteria sub-elements)

INSTRUCTIONS: At the beginning of each AFDP, list sub-elements and the relative significance percentages given to each sub-element. At the end of each month, determine performance level for each sub-element using the Criteria Sub-Element Scoring Table (Attachment J) as a guide. Multiply the relative significance percentage for each sub-element by the performance level for that sub-element to arrive at a percentage score. After doing this for all sub-elements, total the percentage score column. This score will be entered into the composite scoring worksheet by the Award Fee Oversight Committee.

MONTH/YEAR COVERED October 1997 (AFDP 1)

**SEGMENT**

☐ 1 ☒ 3  
☐ 2 ☐ ATMS

**CRITERIA ELEMENT**

☐ TIMELY PERFORMANCE ☐ QUALITY  
☒ MANAGEMENT ☐ PUBLIC INFORMATION/MOT

Sub-Element	Relative Significance Percentage*		Performance Level		Sub-Element Percentage Score
Safety Plan Implemented	20	x	100	=	20
Demonstrate ability to minimize the adverse effects of construction on the public.	25	x	100	=	25
Schedule maintained and updated in a timely manner.	20	x	89	=	17.8
Contractor resolves issues pro-actively & works around potential problems.	25	x	100	=	25
Follow all administrative procedures outlined in the RFP	10	x	88	=	8.8
		x		=	
			TOTAL SCORE FOR SEGMENT SUB- ELEMENTS	=	96.6%
	100%				

\* Relative significance percentage are determined at the beginning of each Award Fee Determination Period. Percentages can change from AFDP to AFDP

Award Fee Procedures

ATTACHMENT I  
**CRITERIA SUB-ELEMENT SCORING TABLE**

(To be used by Performance Evaluators in scoring criteria sub-elements)

Range of Performance Percentage	Description of Performance Level	Number of Detractors Identified	Resolution of Detractors
95-100	<u>Superior Performance:</u> The best performance that could be expected from any contractor. Contractor consistently meets the expected performance level for the criteria sub-element.	No more than three detractors are identified by Performance Evaluators.	All detractors are resolved with no impact to the project.
90-94.9	Contractor consistently meets the expected performance level for the criteria sub-element.	More than three detractors are identified by Performance Evaluators.	All detractors are resolved with no impact to the project.
85-89.9	Contractor consistently meets most of the expected performance levels for the criteria sub-element.	No more than three detractors are identified by Performance Evaluators.	Most detractors are resolved with no impact to the project. The detractors that remain have minimal impact to the project.
80-84.9	Contractor meets most of the expected performance levels for the criteria sub-element.	More than three detractors are identified by Performance Evaluators.	Many detractors are resolved with no impact to the project. The detractors that remain have an impact on the project.
70-79.9	Contractor meets some of the expected performance levels for the criteria sub-element.	Numerous detractors are identified by Performance Evaluators.	Unresolved detractors reoccur and have a major impact on the project.
Below 70	<u>Unacceptable Performance:</u> Major performance deficiencies exist. Contractor consistently fails to meet minimum performance levels for the criteria sub-element.		

ATTACHMENT J

## CONSTRUCTION CRITERIA ELEMENT TOTALING WORKSHEET

(To be used by Construction Performance Evaluators to tally construction segments' quality,  
management and public information/MOT criteria sub-elements)

MONTH/YEAR COVERED AFDP 1 - October 1997

INSTRUCTIONS: Insert scores from Criteria Sub-Element Scoring Worksheets for Construction Functional Area (Attachment H), completed by each construction segment's Performance Evaluators, on the proper line for each Criteria Element. Multiply each score by the percentage allocated to each segment. Subtotal the scores for each Criteria Element and round subtotal to the nearest whole number.

CRITERIA ELEMENT	SEGMENT	SEGMENT SCORE		SEGMENT % OF SCORE		SEGMENT PORTION OF SCORE
<b>Quality</b>	1	93.00	x	.30	=	27.90
	2	90.63	x	.30	=	27.19
	3	88.40	x	.30	=	26.52
	ATMS	99.40	x	.10	=	9.94
<b>Criteria Element Score</b>						91.55

CRITERIA ELEMENT	SEGMENT	SEGMENT SCORE		SEGMENT % OF SCORE		SEGMENT PORTION OF SCORE
<b>Management</b>	1	99.00	x	.30	=	29.70
	2	95.00	x	.30	=	28.50
	3	96.60	x	.30	=	28.98
	ATMS	99.40	x	.10	=	9.94
<b>Criteria Element Score</b>						97.12

CRITERIA ELEMENT	SEGMENT	SEGMENT SCORE		SEGMENT % OF SCORE		SEGMENT PORTION OF SCORE
<b>Public Info/MOT</b>	1	98.00	x	.30	=	29.40
	2	95.00	x	.30	=	28.50
	3	89.00	x	.30	=	26.70
	ATMS	100.00	x	.10	=	10.00
<b>Criteria Element Score</b>						94.60

ATTACHMENT N

# COMPOSITE SCORING WORKSHEET

## For Weighting of Criteria Elements by Functional Areas

(To be used by Award Fee Oversight Committee to determine composite Criteria Element scores)

CRITERIA ELEMENTS											
FUNCTIONAL AREAS	Timely Performance			Quality			Management			Public Information/MOT	
	Weight	Score	Comp.	Weight	Score	Comp.	Weight	Score	Comp.	Weight	Score
Construction (Insert scores from Attachments J and K)	100%	93.03	93.03	35%	91.55	77.82	85%	97.12	82.55	15%	94.60
Design (Insert scores from Attachment G)	0%			15%	96.50	14.48	15%	99.10	14.87	0%	
Public Information (Insert score from Attachment G)	5%			9%			0%			85%	79.71
TOTAL	100%		93.03	100%		92.30	100%		97.42	100%	93.90

## AWARD FEE SUMMARY REPORT

(To be completed at end of each Award Fee Determination Period by Award Fee Oversight Committee)

## MONTH/YEAR COVERED AFDP 1 - OCTOBER 1997

## Scoring Calculation (insert scores from Attachment N)

Element	Percentage Score	Weighting*	Element Score
A. Timely Performance	93.03	X 1.00	= 93.03 A
B. Other Three Criteria Elements:			
Quality of Work	92.3	X 0.25	= 23.08
Management	97.42	X 0.5	= 48.71
Public Information/MOT	93.9	X 0.25	= 23.48
Total Score			= 95.28 B

## Award Fee Earned Calculation

	A. Timely Perf.	B. Other Three
Percent of Award Fee Earned (from Award Fee Conversion Table)	98.03 %	100 %
Available Pool in AFDP	\$ 500,000.00	\$ 2,000,000.00
Award Fee Earned	\$ 490,133.00	A \$ 2,000,000.00 B
Uncompleted Milestones	\$ -	C
Total Award Fee (A-C)+B	\$ 2,490,133.00	

Notes: (1) \*See "Weighting by AFDP" table.

(2) The total award fee earned for Timely Performance in Period 9 and for Early Completion (Supplemental Award Fee for Early Completion, Paragraph 1.2) will be reduced by 50 percent if the Percentage Score for Quality of Work in Period 9 is less than 80.

Award Fee Procedures

Weighting by AFDP			
AFDP	Timely Perf.	Quality	Management
1	1.00	0.25	0.50
2	1.00	0.50	0.15
3	1.00	0.50	0.15
4	1.00	0.50	0.15
5	1.00	0.50	0.15
6	1.00	0.50	0.15
7	1.00	0.50	0.15
8	1.00	0.50	0.15
9	1.00	0.65	0.10
			P/MOT
			0.25
			0.35
			0.35
			0.35
			0.35
			0.35
			0.35
			0.35
			0.25

Available Award Fee Pool By Period			
AFDP	Period Covered	Timely Performance	Other 3 Criteria Elements
1	NTP - 10/31/97	\$500,000	\$2,000,000
2	11/1/97 - 4/30/98	\$1,750,000	\$3,250,000
3	5/1/98 - 10/31/98	\$1,750,000	\$3,250,000
4	11/1/98 - 4/30/99	\$1,750,000	\$3,250,000
5	5/1/99 - 10/31/99	\$1,750,000	\$3,250,000
6	11/1/99 - 4/30/00	\$1,750,000	\$3,250,000
7	5/1/00 - 10/31/00	\$1,750,000	\$3,250,000
8	11/1/00 - 4/30/01	\$1,750,000	\$3,250,000
9	5/1/01 - Completion	\$3,375,000	\$4,125,000
Supplemental award fee for early completion		\$5,000,000	
TOTAL		\$21,125,000	\$28,875,000

## ATTACHMENT Q

**AWARD FEE CONVERSION TABLE**

(To be used by Award Fee Oversight Committee to determine percentage of award fee earned)

SCORE	% OF AWARD FEE EARNED
100	100
99	100
98	100
97	100
96	100
95	100
94	99
93	98
92	97
91	96
90	95
89	93
88	91
87	89
86	87
85	85
84	80
83	75
82	70
81	65
80	60
79	54
78	48
77	42
76	36
75	30
74	24
73	18
72	12
71	6
70	0

## **APPENDIX J**

## **AWARD FEE CRITERIA AND SUB-CRITERIA GUIDELINES**

### **AWARD FEE CRITERIA**

1. Timely Performance
2. Quality of Work
3. Management
4. Community Relations/Maintenance of Traffic

### **AWARD FEE CRITERIA AND SUB-CRITERIA FOR AWARD FEE DETERMINATION - PHASE 1**

#### **Timely Performance**

- Approved Initial Plan Update and subsequent Monthly Plan Updates made in accordance with Contract requirements
- Survey control set up
- Mobilization completed on schedule
- Design and construction on-schedule, including early construction required by the Contract
- Aesthetics and landscaping concepts submitted and approved
- Maintenance during Construction underway in accordance with Contract requirements and approved plan
- Initial meetings with utilities scheduled and held in a timely manner; Contractor pursuing supplemental agreements to meet its plan (schedule).
- Performance with respect to schedule meeting the Minimum Performance Schedule will receive a percentage score of 80; performance meeting the average of the early and late start curves will receive a percentage score of 90

#### **Quality of Work**

- QC/QA Plans submitted and approved
- Design QC/QA proceeding in accordance with approved plan



- Construction and Maintenance QC/QA proceeding in accordance with approved plans

## **Management**

- If Partnering is elected, partnering agreement with the Department in place and being utilized
- If Partnering is elected, partnering agreements with Major Participants and Major Subcontractors in-place and being utilized
- Contractors key personnel and management staff in-place; project office(s) established and operational
- Facilities for co-locating the Department project management team with Contractors
- Project office in-place and in accordance with Contract requirements
- Facilities for co-locating the Department resident engineer staffs with Contractors working segment superintendents in-place and in accordance with Contract requirements
- Design staff in-place
- Subcontracting Plan submitted and approved, including procedures for competitive procurement
- Compliance with Contract requirements for DBE and EEO
- Project working segments designated
- Schedule of Values submitted and approved
- Plan for auditing progress submitted, approved, and operating
- Safety Plan and Manual submitted, approved and operating
- Document Control System in-place in accordance with Contract requirements
- Communication systems in-place as required by Contract
- Electronic payroll submittal system in-place and operating
- Contractor member firms and all subcontractors enrolled in OCIP

- Labor hours submitted in accordance with insurance requirements of the Contract and OCIP
- Correctness of invoices

#### **Community Relations/Maintenance of Traffic**

- MOT Plans submitted and operating within specified criteria
- Contacts made with local municipalities, county, utilities, railroads, Utah Highway Patrol, emergency response agencies, and Department of Environmental Quality; coordination efforts underway and continuing
- Required local permits obtained
- Public information personnel in place; public information efforts conducted in accordance with defined strategies and coordinated with the Department

#### **AWARD FEE CRITERIA AND SUB-CRITERIA FOR AWARD FEE DETERMINATION - PHASE 2 AND SUBSEQUENT PHASES**

##### **Timely Performance**

- Design and construction on-schedule; all major milestones met or exceeded
- Maintenance during Construction conducted in timely manner in accordance with contract requirements
- Monthly Plan Updates made in accordance with Contract requirements
- Impact of modifications/differing conditions on project schedule is minimized
- Work and cooperation with utilities progressing to meet Contractors plan (schedule); organization set up for dealing with utilities
- Performance with respect to schedule meeting the Minimum Performance Schedule will receive a percentage score of 80; performance meeting the average of the early and late start curves will receive a percentage score of 90.

##### **Quality of Work**

- Design QC/QA proceeding in accordance with approved plan

- Construction and Maintenance QC/QA proceeding in accordance with approved plans
- Instances of rework are minimized
- Quality of workmanship exceeds usual industry standards
- Contractor QC/QA staff directs rework or correction of deficiencies before
- Department representatives
- Submittals and information presented at oversight reviews are complete, accurate and timely
- QA reporting is complete, accurate, and timely
- ANSI/ASQC Q9001 certification achieved by the end of AFDP 2.
- ANSI/ASQC Q9001 certification maintained for AFDP's 3 through 9.

#### **Management**

- Baseline Plan and approved Monthly Plan Updates being utilized to manage project
- If Partnering elected, Partnering agreement with the Department being used
- If Partnering elected, Partnering agreements with major subcontractors being utilized
- Contractor provided facilities for the Department staff well maintained
- Approved Subcontracting Plan being followed
- Compliance with Contract requirements for DBE and EEO
- Approved plan for auditing progress being used
- Approved Safety Plan being used and revised as necessary to meet Project requirements; Aggressive accident prevention/safety program is maintained
- Document Control System being utilized
- Communication systems operational and effective
- Electronic payroll submittal system in-place and operating
- Contractor member firms and all subcontractors enrolled in OCIP

- Labor hours submitted in accordance with insurance requirements of the Contract and OCIP
- Subcontractors are well managed and coordinated
- Schedules maintained and updated in a timely manner
- Contractors staff turnover is managed to minimize adverse impacts to Project; turnover of key personnel is minimized
- Timely payment of subcontractors and suppliers
- Works around problems without filing claims
- Correctness of invoices

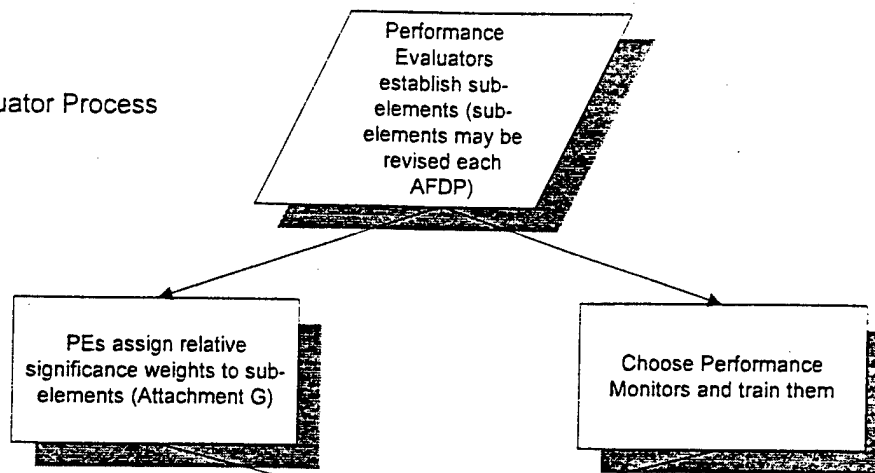
#### **Community Relations/Maintenance of Traffic**

- Air Quality Approval Order and Emissions Control Plan requirements are met
- Proactive public information/ community relations
- Operations conducted in manner that is responsive to key community concerns (Maintenance of Traffic and Air Quality)
- Water quality requirements are met
- Environmental and other Project commitments and requirements are tracked, recorded and met Maintenance of Traffic criteria are met
- Contacts maintained with local municipalities, county, utilities, railroads, Utah
- Highway Patrol, emergency response agencies; coordination efforts continuing
- Public information efforts coordinated with the Department
- Participating with the Department and the Department of Environmental Quality under the provisions of the Memorandum of Understanding (see RFP Section 13.1) to address
- MOT and air quality issues
- Needs for business access accommodated in MOT plans and operations
- Public information efforts conducted in accordance with defined strategies and coordinated with the Department

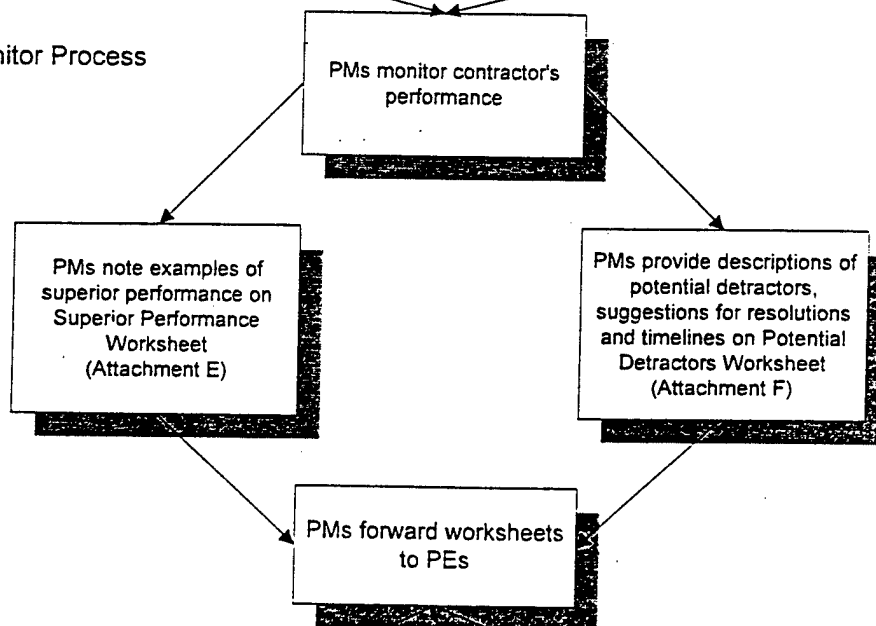
## **APPENDIX K**

# AWARD FEE PROCESS FLOW CHART

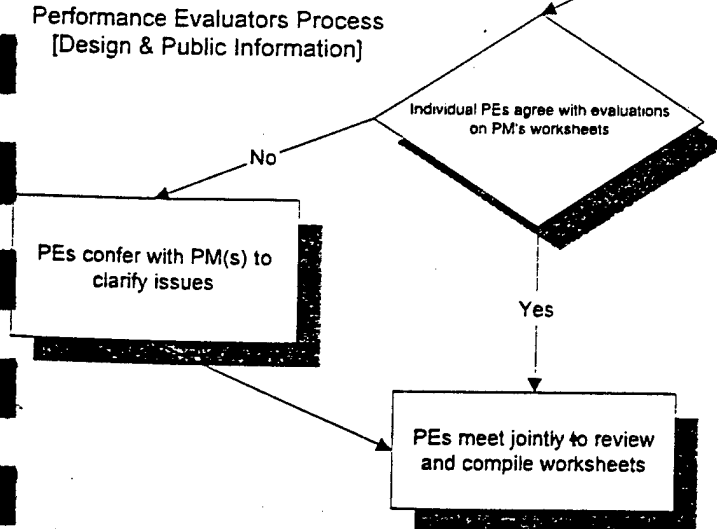
## Performance Evaluator Process



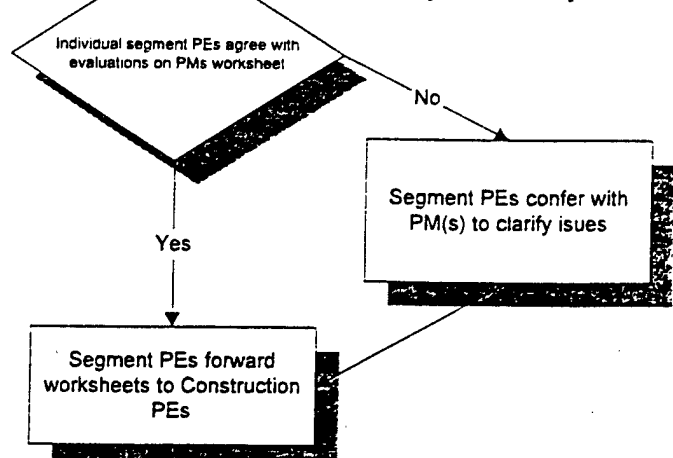
## Performance Monitor Process



## Performance Evaluators Process [Design & Public Information]



## Performance Evaluator Process [Construction]



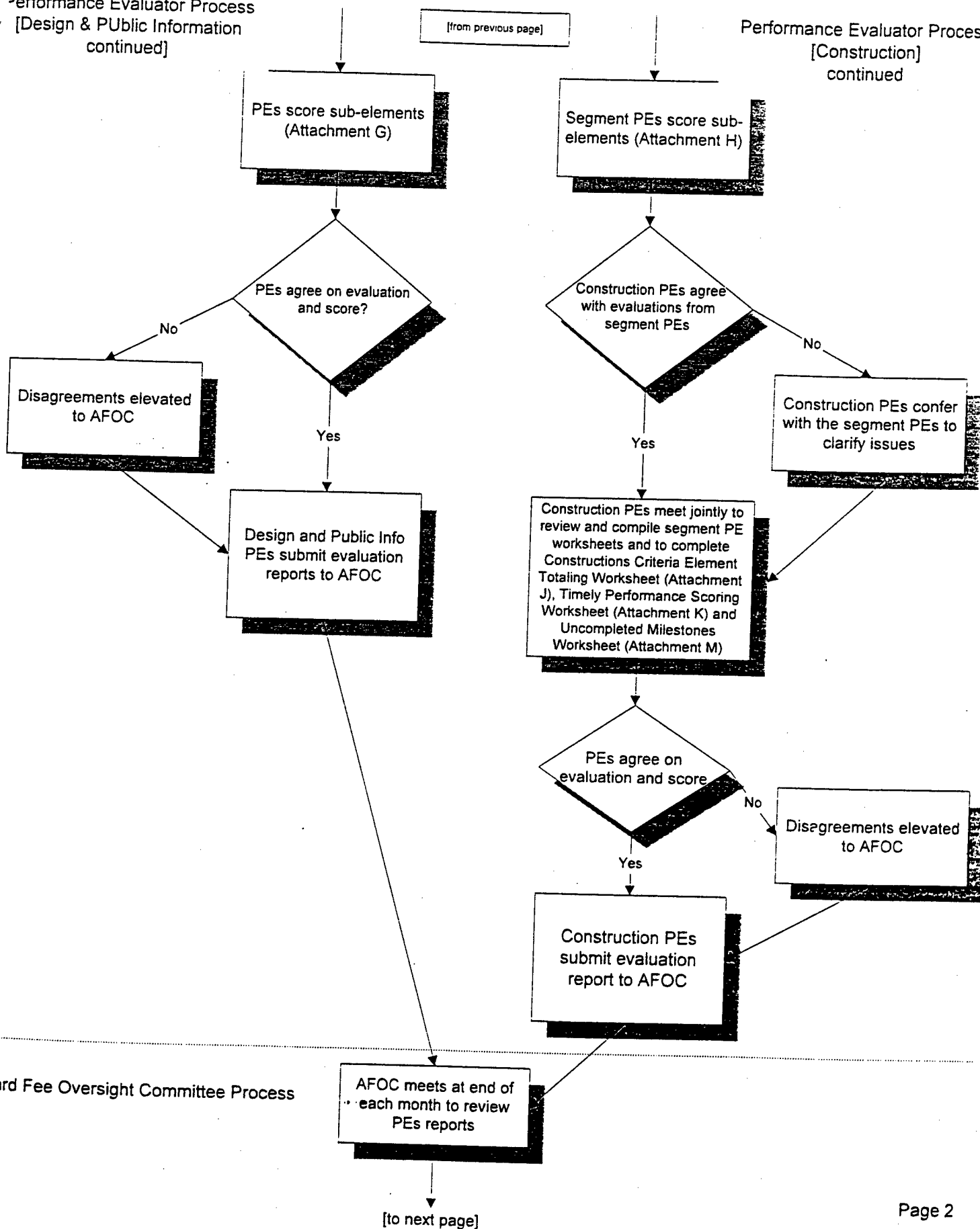
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# AWARD FEE PROCESS FLOW CHART

Performance Evaluator Process  
[Design & Public Information  
continued]

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Performance Evaluator Process  
[Construction]  
continued



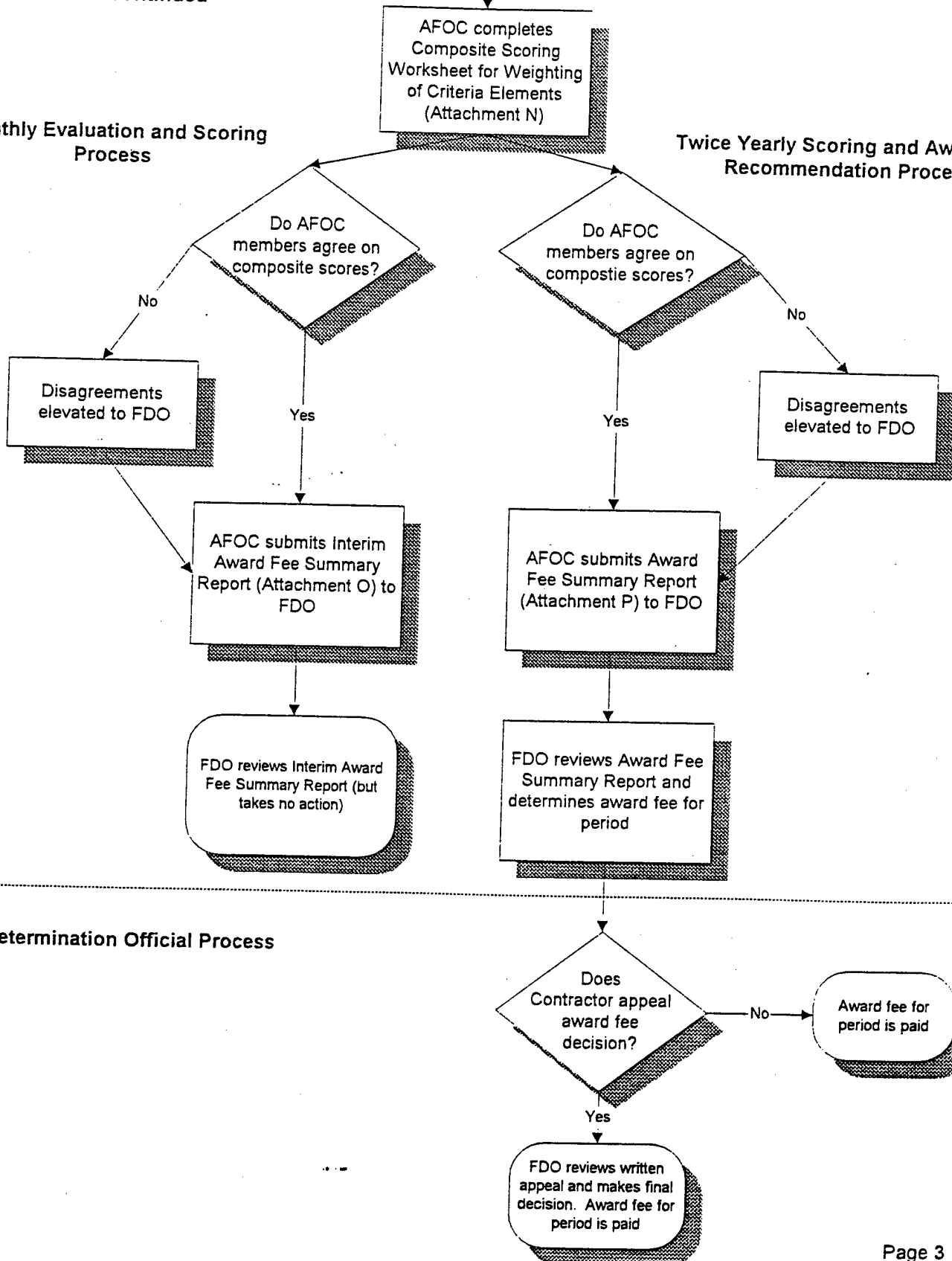
# AWARD FEE PROCESS FLOW CHART

[from previous page]

Award Fee Oversight Committee  
Process continued

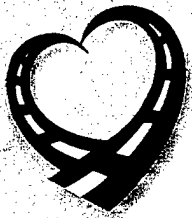
Monthly Evaluation and Scoring  
Process

Twice Yearly Scoring and Award Fee  
Recommendation Process





**APPENDIX L**



# INTERSTATE 15

## RECONSTRUCTION

### PLAN ON IT!

Winter 1999

## Ramp Openings Give Motorists a Glimpse of the New I-15

Have you driven a new ramp lately? If you haven't, you owe it to yourself to experience the future of I-15. The I-15 Team recently opened new ramps at 10600 South, 7200 South, 4500 South and 600 North. New ramps were also opened at the I-215 south junction. The two ramps connect I-15 northbound to I-215 eastbound and westbound and I-215 eastbound to I-15 southbound.

The ramps at the I-215 south junction are part of a new collector distributor sys-

tem that uses improved merges and additional ramp space to increase the efficiency of the freeway junction. As the new I-15 takes shape, motorists will notice many such ramps along the I-15 corridor. Because of collector distributors, transitions to and from freeway interchanges will be much smoother.

If you'd like to experience a new collector distributor for yourself, take a ride on either I-15 southbound or I-215 eastbound to 7200 South. You'll appreciate the direct connection to your destination.



The new collector distributor at the I-215 south junction provides motorists with a smoother transition from freeway to freeway.



1-888-INFO-I-15 (1-888-463-6415) WEB: WWW.I-15.COM

# Driving in a Winter Wonderland

Driving under winter conditions in the intermountain area can be a challenge. Sometimes a day with beautiful blue skies can end up as a day with icy road conditions. Keeping abreast of the latest weather report is one way to stay ahead of Mother Nature, but even weather reports can change frequently. The following safe driving practices can help you on the road during winter:

## STAY IN CONTROL

- Do not panic.
- When bad weather strikes, reduce your speed and allow more time to safely reach your destination.
- Leave plenty of distance between you and other vehicles.
- Do not pass snow plows - there is almost no visibility when passing a plow and in some areas there is not enough room for both a car and the plow blade.

## DO NOT STOP ON THE FREEWAY

- Use emergency pull-outs or exit the interstate if you run into car trouble. Pull to

the far right and wait in your car for help to arrive.

## MAINTAIN TRACTION

- Put snow tires on before the snow flies. If tires are showing signs of wear, have them replaced to ensure good road contact.
- When weather gets bad, engage your 4-wheel drive.
- When driving on a bridge or ramp, take extra precautions and look for ice. Begin to slow down before you head into a curve. Apply brakes gradually and softly to avoid skidding.

## INCREASE VISIBILITY

- Clean off your car prior to driving.
- Make sure windshield wipers are in good repair.
- Drive with your lights on.



## USE COMMON SENSE

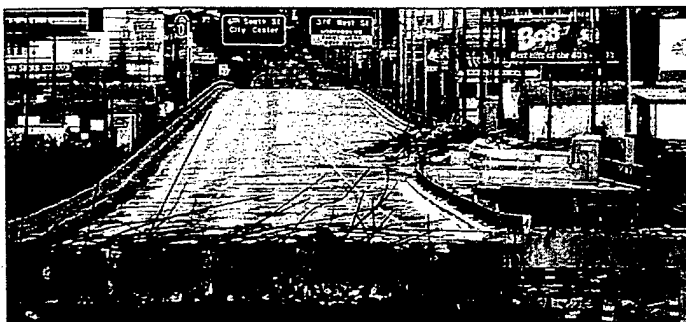
- Warm up your car before departure.
- Let people know where you are going and the route you plan to take.
- Make sure you have at least a half a tank of gas before entering the interstate.
- Slow down when weather conditions are poor.

*Utah Safety Council contributed to this article.*

# 500 South

When the 500 South on-ramp to I-15 southbound closes in February, the entire downtown 500 South/600 South interchange will be under construction. But help is on the way. This summer, two ramps at the new 400 South interchange will allow access from downtown Salt Lake City to I-15 northbound and southbound. Also, the 600 South interchange will be complete in fall 1999.

Work on the downtown ramps began fall of 1998 with the demolition of the 600 South viaduct.



## T i m e l i n e

1999

500 South northbound and southbound ramps close

January 1999

400 South opens. Temporary configuration includes access to I-15 northbound and southbound.

Summer 1999

600 South re-opens, providing northbound access into downtown.

Fall 1999

2000

2001

500 South re-opens for southbound motorists. Final configuration of 400 South complete. Access at 400 South for northbound motorists and southbound carpool lane.

Spring 2001

October 2001

# "The Road of the Future"

by Tom Warne

Executive Director, Utah Department of Transportation



Some exciting things happened during the last part of 1998 for members of the I-15 Reconstruction Team as well as for drivers on the I-15 corridor.

A series of ramp openings — including ramps at 600 North, 10600 South and the I-215 interchange — made the 17-mile stretch of reconstructed freeway a little easier to access. And the opening of new pavement between the I-215 interchange and 10600 South introduced motorists to what it will be like to drive on the "road of the future."

For the first time since beginning the reconstruction process 20 months ago we're able to say, "This section of the new freeway is basically finished." You can drive on it and see that we're making progress. Your patience and cooperation during the reconstruction process is being rewarded with new ramps and roads that will give you some idea of what our new freeway is going to be like.

During the next few months, you'll see more of these openings along the corridor as the new freeway continues to take shape. Of course, you'll see some closures, too. But perhaps those closures will be a little easier to take now that they are usually coupled with concurrent openings along the "road of the future."

With all of these changes, it will be even more important for motorists to stay current with openings and closings. The map and schedule printed in this newsletter will be helpful, but you'll also want to pay attention to radio and television traffic reports - we work very hard to provide the latest and most up-to-date information to them so they can keep you posted with current road conditions. And don't forget to check the I-15 Web site at [www.I-15.com](http://www.I-15.com) and our telephone hotline at 1-888-INFO-I-15.

## Walls Help Residents Cope With I-15 Sound Effects

There's more to rebuilding a freeway than erecting bridges and pouring concrete. Part of the I-15 Reconstruction project includes designing and building over 55,593 feet of sound walls along the I-15 corridor. These walls, which are about seven inches thick and of various heights, are designed to help minimize the noise impacts related to a 12-lane freeway.

Sound walls are an important element of the reconstruction process. The contractor began designing sound walls two weeks after they signed the contract to rebuild I-15.

Engineers take several things into consideration when designing the walls. The location of homes along the I-15 corridor, the number of lanes and the expected volume of traffic all play a part in where walls are placed.

The Federal Highway Administration has developed a computer program which helps engineers determine the proper height of a soundwall. Engineers create a model situation based on the height of area houses as well as freeway elevation. Based on this model, the program helps engineers determine how high the wall needs to be to effectively muffle freeway noise.

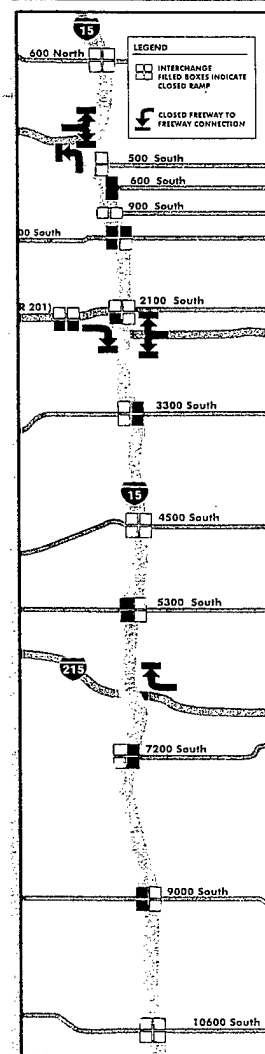
Other details, such as leaving room next to the interstate for snow storage, are also considered during the design process.

The sound walls along the I-15 corridor have what is referred to as a "fractured fin" texture, which means that there are ridges in the face of the wall. The ridges vary in height, which creates the appearance of a "mountain motif." No extra cost was incurred because of this aesthetic feature. The colors of the walls, "desert sage" and "mountain dusk", were chosen because they're subtle and also match the surrounding environment.

Although they aren't painted, sound walls can be seen at the south end of the project between 9000 South and 7200 South.



### Openings and Closings January though April 1999



#### Closing

- 500 South ramps to I-15 northbound and southbound - January/February

#### Note:

Most of this year's openings and closings will occur during the April through October 1999 construction season.

ALL DATES DEPEND ON WEATHER AND SUBJECT TO CHANGE



## INTERSTATE 15 RECONSTRUCTION

480 North 2200 West  
Salt Lake City, UT 84116



## Ask Connie!

Connie Hill is a Community Relations representative for the I-15 Team.  
You can reach Connie via e-mail at [chill@lscy.com](mailto:chill@lscy.com).

### Q: Are there specific materials available related to the I-15 Reconstruction project?

A: The Public Information Department creates and prints written information regarding several aspects of the project. Currently available materials include:

- Fall 1998 Community Newsletter
- Winter 1998-99 Community Newsletter (such as this one)
- 4-color Map indicating what's closed and what's open. (A smaller reproduction of this map is on page 1).
- Alternate Route maps to help business owners get customers to their doors, including maps for 5300 South, 500 & 600 South and 9000 South.
- Directional Map, which gives directions to and from tourist destinations and the airport.

To receive the above information, please call 594-6461 and specify which piece you are interested in, or send the coupon below to: Public Information, 480 North 2200 West, Building B, Second Floor, Salt Lake City, UT 84116. The I-15 Reconstruction Web Site is another excellent source for information at [www.I-15.com](http://www.I-15.com). Web Site visuals can be downloaded.

### PLEASE SEND ME THE FOLLOWING MATERIALS:

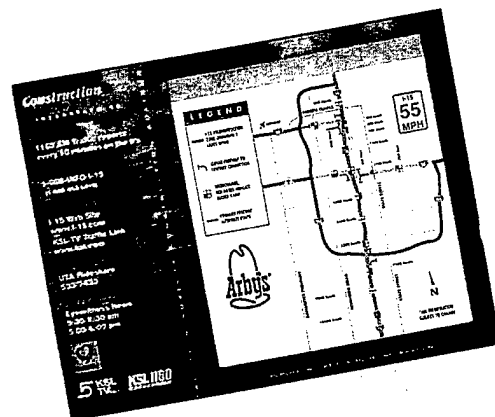
- ☐ Fall 1998 Community Newsletter
- ☐ An additional copy of the Winter 1999 Community Newsletter
- ☐ A large 4-color map
- ☐ Alternate route map (please specify which area)
- ☐ 5300 South   ☐ 500/600 South   ☐ 9000 South
- ☐ Directional Map to/from the International Airport

Name .....

Address .....

City, State, Zip .....

## The Construction Advisor



The Construction Advisor, brought to you by the I-15 Team, KSL-TV and Arby's, is your personal construction assistant. Fold it around your car's sun visor and you have instant access to what's open right now during I-15 Reconstruction. Get the Construction Advisor at Wasatch Front Arby's locations.

**Stay up-to-date  
on I-15  
Reconstruction.**

To receive each I-15 newsletter by mail,  
call 594-6461.